



REPORT OF THE
**Hydro-Electric Power
Commission**
OF ONTARIO
1919

VOL. III.

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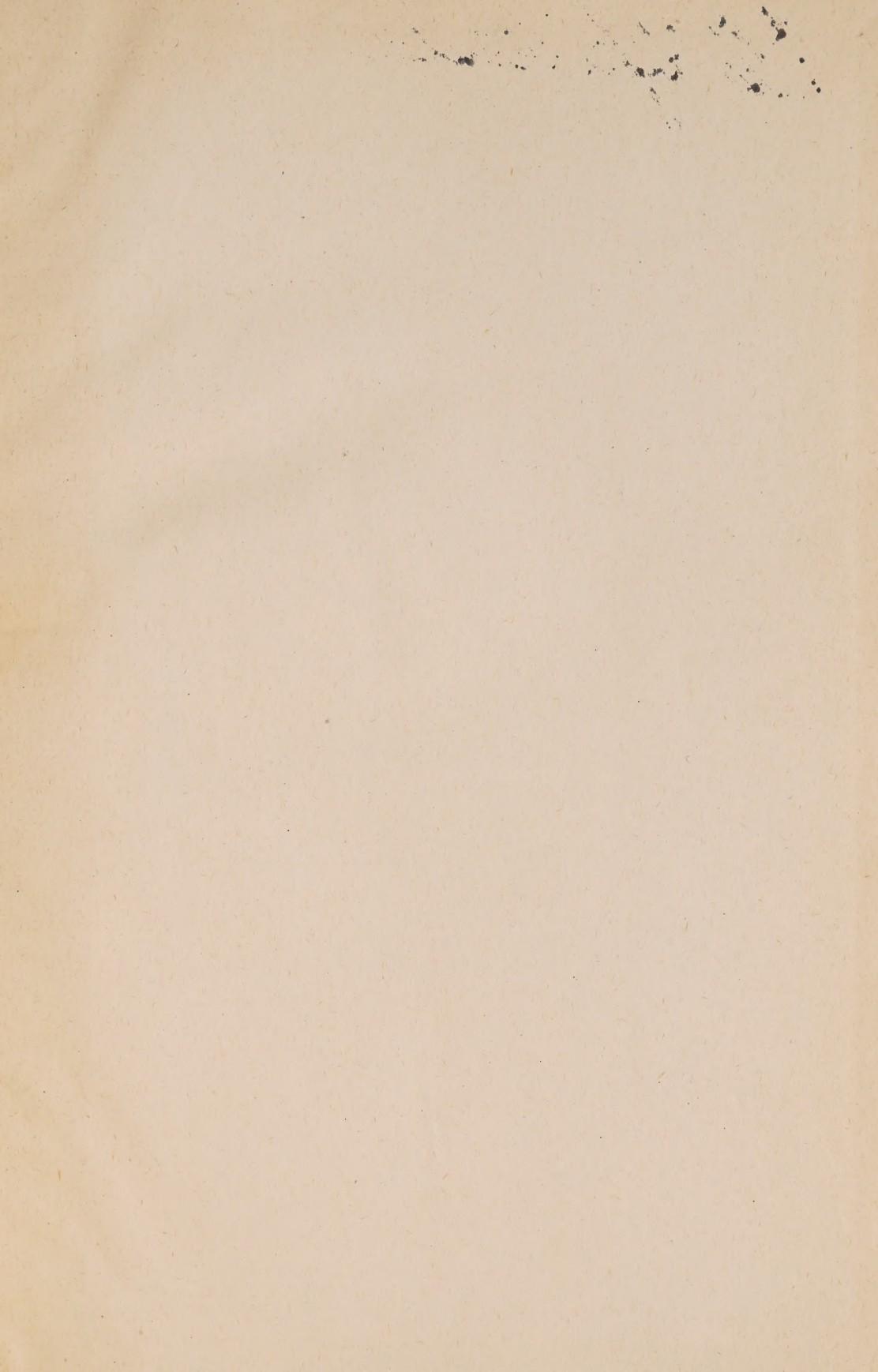
WILLS MACLACHLAN, Esq.

Wills MacLachlan



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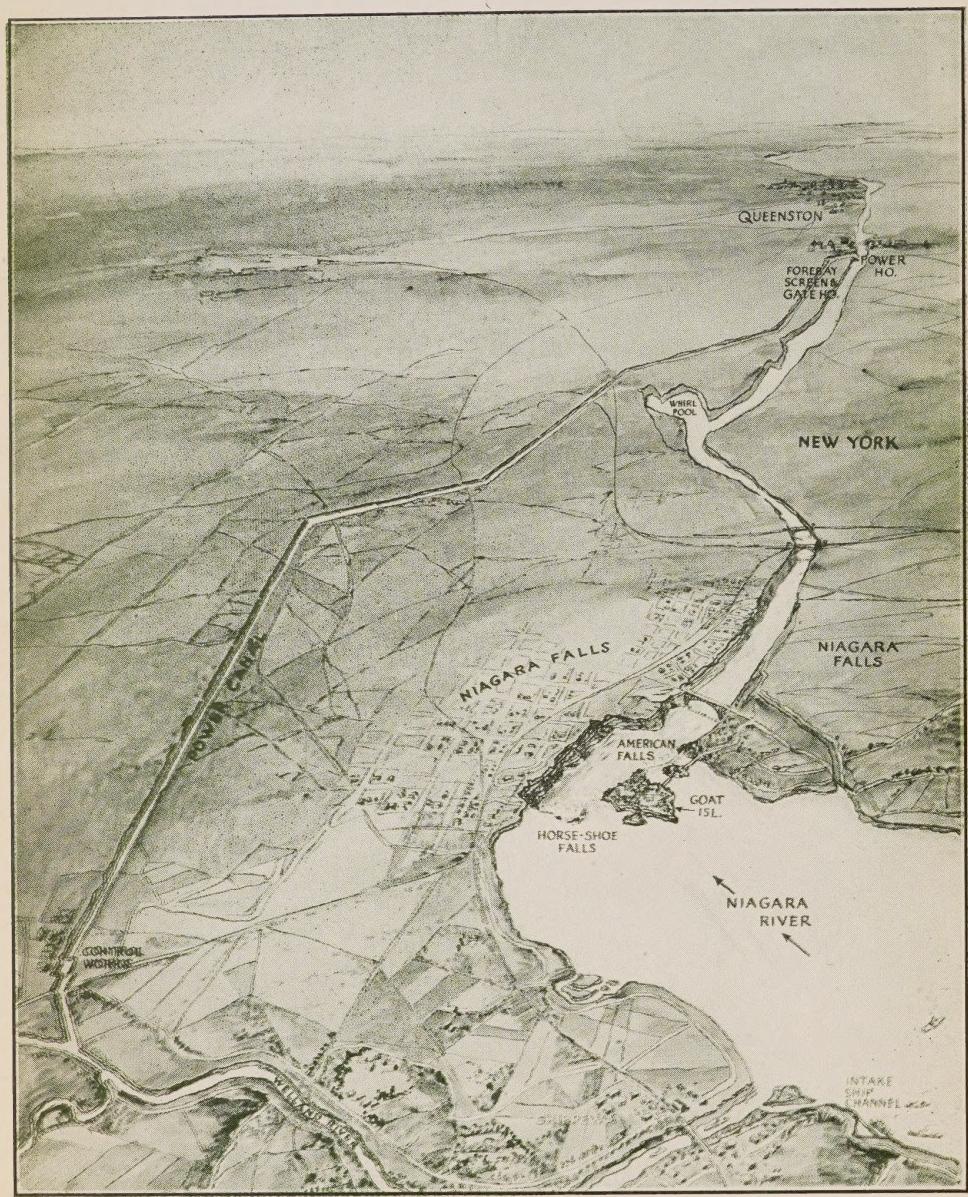
The Estate of the Late
Wills MacLachlan, '06





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The Chippawa-Queenston Power Development.

Govt Doc Ontario Hydro Electric
Ontario Power Commission

H (Twelfth) Annual Report

OF THE

HYDRO-ELECTRIC POWER COMMISSION

OF THE

PROVINCE OF ONTARIO

FOR THE YEAR ENDED OCTOBER 31st

1919

VOLUME III

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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1920

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To His Honour THE HONOURABLE LIONEL H. CLARKE,
Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to your Honour Volume III of the Twelfth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1919.

The Commission in submitting its Annual Report for the fiscal year does so with a measure of pride in the extremely satisfactory results of the operations of a year which has been pregnant with difficulties, due to the period of readjustment succeeding the successful conclusion of the World War in November, 1918.

The year has been fraught with many difficulties, having commenced as it did at the most critical period in the great conflict when every effort was being made by the Commission to supply the enormous demands for power in all districts for the manufacture of munitions. The signing of the Armistice came shortly after the beginning of the year, and still more obstacles were encountered during the readjustment period, when the industries throughout the Province were returning to commercial lines, during which time the loads on many systems were reduced to such an extent as to seriously decrease the revenues and consequently to embarrass the financial operations of the municipalities on these systems.

At the time of the signing of the Armistice, the Commission was supplying power in the various parts of the Province to over 400 plants working on the manufacture of munitions and war supplies. These plants were at that time using approximately 70 per cent. of the total amount of power supplied by the Commission on all systems. Immediately after the Armistice was signed most of these plants were temporarily idle until such time as their machinery, equipment and organizations could be readjusted to a peace-time basis, so that for at least eight months of the fiscal year the loads in many of the municipalities supplied had not reached normal proportions, and more especially was this true in the case of those municipalities where large blocks of power had been supplied for munition production. In some of these municipalities the loads declined 25 per cent. or more when the munition loads ceased, and it was not until the month of August that the loads reached normal proportions, from which time the recovery of commercial industries in the Province was so rapid that practically all of the available power was being used by the end of the year.

When the war broke out and there was pressing need for munitions, the Canadian manufacturers were approached by the Government with a view to ascertaining to what extent Canada could participate in supplying these demands, and while many manufacturing companies were willing to convert their entire organizations to the production of munitions, this would have been useless had not the Commission been able during the first three years of the war to supply the large quantities of power necessary to operate these plants.

In 1917 the Commission realized that its reserve of power available for the manufacture of munitions would soon be exhausted, and steps were then promptly taken to augment the supply.

This necessitated the expenditure of large sums of money on the construction of extensions to generating plants, transmission lines and systems, approximately \$7,600,000 being expended to produce 54,000 horse-power, all of which would have been available for munitions manufacture. The Commission also made arrangements whereby the Ontario Power Company of Niagara Falls was relieved of

supplying 10,000 horsepower for export; in order that this additional power might be available for munitions manufacture.

The cost of the above extensions was greatly increased by the rapid rise in the cost of labour, equipment and materials. In purchasing the equipment for these emergency plants it was found to be impossible to obtain all the necessary machinery and equipment in Canada, and no course was open but to purchase much of the apparatus in the United States in order that these plants might be constructed in the shortest possible space of time in order to be available for the supply of power for munitions production. On this account the Commission was obliged to expend large sums in duties and war taxes, amounting to over \$652,000, or an average of 37½ per cent. of the purchase price.

During this period the labour situation was acute; not only was it almost impossible to obtain sufficient labour to carry on the work expeditiously, but the cost of labour had nearly doubled over that of pre-war days. Moreover, as is generally known, the efficiency of labour had decreased in proportion to the increase in the cost of same. The general scarcity of labour and increase in wages during the year resulted in the amount of the operating pay-rolls increasing in many cases by more than 60 per cent. over that of the previous year. The cost of materials also increased approximately 25 per cent. These factors had a most serious effect upon the operations of the Commission and were utterly beyond the power of the Commission to control, as has been the case with industries of every nature throughout the Province.

However, in spite of the enormous, uncontrollable increase in operating expenses, the revenues of the Commission have been in the main sufficient to meet all operating expenses and necessary fixed charges, practically the only exceptions being those municipalities in which large blocks of power were supplied for the manufacture of munitions, and which after the cessation of hostilities were not replaced by commercial loads until late in the year. In most of these municipalities the building up of loads to normal conditions during the coming year will place them on a paying basis, and where such is not the case a readjustment of rates may be necessary.

At the beginning of the year, the Commission fixed a schedule of rates covering the estimated cost of service to all municipalities. These rates brought in a total revenue of \$3,729,705.75, while the actual cost of service was \$3,860,700.79, which includes the total expenses for interest, cost of power, operation and maintenance, amounting to \$3,243,329.02, and all the necessary fixed charges and reserves, such as sinking fund, reserves for renewals and contingencies, amounting to \$617,371.77. After meeting all operating expenses and setting aside the reserves as above set out (in accordance with Section 23 of the Power Commission Act) the expenditures exceeded the revenue by \$130,995.04; the cost of service to all municipalities exceeding the estimates by but 3.5 per cent., a very remarkable showing in view of the phenomenal increase in the cost of labour and material. Bills and credit memoranda have been sent to the municipalities for the difference between the actual cost of service and the bills as rendered, which have already been taken up and incorporated in the books of the municipalities.

For the first time the operating reports and balance sheets of the municipalities, which appear in Volume II, will include in the cost of power, the annual adjustment from the books of this Commission, and will reflect complete operating results and all liabilities of every kind growing out of the co-operative development and transmission and the municipal distribution of electrical energy.

AUDIT

In addition to that audit carried on under the direction of the Auditor for the Province of Ontario, covering the period from the appointment of the Commission to the end of the fiscal period, October 31st, 1916, it was ordered and directed by an Order-in-Council dated May 3rd, 1916, that an independent audit and investigation of the Commission's records and books of account was to be made and for this purpose the accounting firm of Messrs. Clarkson, Gordon and Dilworth received the appointment under this Order-in-Council and shortly after its issuance commenced their duties. Messrs. Clarkson, Gordon and Dilworth completed their investigations and audit February 16th, 1918, which, as before stated, covered the activities of the Commission from the date of its appointment, 1906, up to and including the last day of the fiscal year ending October 31st, 1916, and their report was duly presented to the Treasurer of Ontario. Subsequent to this date and at the request of the Commission, the Auditors were instructed to make in like manner an audit of the accounts for the year 1917, which was done and reported upon to the Provincial Treasurer under date of August 22nd, 1918. As appointees of the Commission the audit was continued by the same firm and completed under date of April 16th, 1919, for that period ending October 31st, 1918, since which time a continuous monthly audit has been carried on, and the latest report covers the period ending October 31st, 1919, and was submitted under date of April 3rd, 1920.

NIAGARA SYSTEM

Early in the year 1917 the Commission realized that the enormous demands for power for war munition work would soon exhaust the available supply in the Niagara District, and in the summer of that year the Ontario Power Company of Niagara Falls, which is owned and operated by the Commission, approved of an expenditure of over \$2,000,000 to install a temporary pipe line and two additional generators having a total capacity of approximately 45,000 horse-power, to obtain additional power for munition manufacturing in this district. By installing a temporary wood-stave pipe line, over a year's time was saved, and water was turned into the pipe line within a year from the date the construction work was started.

On December 31st, 1918, The Toronto Power Company ceased to supply the Ontario Power Company of Niagara Falls with 11,000 horse-power that was being supplied under the Power Controller's orders, and on March 1st, 1919, a further block of 13,200 horse-power was cut off. The extension to the Ontario Power Company of Niagara Falls was sufficient to take care of these reductions in power supply and of an additional 21,000 horse-power for additional loads on the system.

At the time of the signing of the Armistice, the Commission was supplying over 80,000 horse-power to 360 plants working on the manufacture of munitions. Within eight months after the signing of the Armistice, the industries in the district had absorbed all of this available power, and so rapid was the recovery of the industries, that before the end of the year all of the available power supply was used up and it was necessary for the Commission to limit the amount of power supplied to the municipalities on this System.

Anticipating a shortage of power, the Commission is negotiating for an additional supply, and expects to obtain at least 20,000 horse-power for this System early in the coming year.

Queenston-Chippawa Development

The construction work on the Queenston-Chippawa Development, which was commenced in May, 1917, has been pushed night and day since that time. This work, however, has been carried on under great difficulties owing to the scarce, inefficient and unstable common labour supply.

Since this project was started, the vast increase in the prospective market for power has necessitated increasing the capacity of the power canal which, together with a corresponding increase in the capacity of the generating station, will greatly add to the capital cost of the development, and, based on this increased capacity and with construction under constantly increasing cost of labour and materials, the development will cost much more than the original estimate for the scheme of smaller capacity.

The estimated progress schedule for work on the development was maintained in all important particulars except in rock excavation, which, on account of the above mentioned labour difficulties, is somewhat behind our estimated schedule, but present progress shows marked improvement and is greater than schedule.

In the construction of the canal for this project it was necessary for the Commission to acquire approximately 3,100 acres of land, of which approximately 1,000 acres will be ultimately required for construction purposes.

The route of this canal traverses, in the most part, very valuable properties, cutting through orchards, vineyards, small fruit and farming districts in such a manner as to preclude the possibility of securing such sections of land only as might be necessary for construction purposes. This fact necessitated the acquisition, in some cases, of farms intact and tracts of land not necessary for the ultimate requirements of the works and which will later have to be disposed of by the Commission when the construction work has been completed.

In connection with this surplus land, the Commission was faced with the problem of how best to deal with such valuable lands. To allow them to remain idle during the period of construction—four or five years—was considered to be unjustifiable, and to rent the properties at an equitable figure in view of the circumstances, was found to be impossible. It was therefore decided to operate these lands in order to maintain them in such a condition that they could be sold advantageously when the construction work on the canal has been completed. It was not anticipated, however, that the revenue obtained from such operation would be sufficient to meet all costs in connection with the farms, but it is expected that the revenue from crops and fruit yield during the next two years will materially reduce operating deficits.

Assuming that the total sum not covered by revenue to date is all charged by way of maintenance or betterments to the property, it is found to be a reasonable percentage, viz.: 5 per cent. of the total amount expended on right-of-way.

SEVERN SYSTEM

The abnormal demands for power for munition manufacture by municipalities on this System made it necessary for the Commission to extend the Big Chute Generating Station, at a cost of approximately \$215,000.00, from which extension an additional 2,000 horsepower was obtained for munition work.

After the Armistice was signed, the loads on the Severn System decreased over 25 per cent. in those municipalities supplying large blocks of power for munition manufacture, and had not reached normal conditions at the end of the year.

An increase in operation and maintenance of the System during the year of \$18,168.34 or 47 per cent. together with an increase in interest charges—largely due to the increase in the power plants—amounting to \$19,294.73 or 54 per cent., prevented this System from giving as favourable an operating statement as was anticipated, the actual cost of the service exceeding the estimate by about 22 per cent. With the restoration of normal conditions, satisfactory operating results are confidently anticipated.

EUGENIA SYSTEM

This System having a large storage capacity, is used during periods of the day to supply power to the Severn System, and credit is allowed this System on account of such power supplied. The dropping off, however, of munition loads on the Severn System reduced the amount of power used by that System during the year, and seriously affected the revenue of the Eugenia System.

The operation and maintenance expense increased by \$17,493.41, or 50.7 per cent. over the previous year, and the interest charges increased \$8,708.52, or 17.1 per cent. over those of 1918. However, the actual cost of operation, maintenance and the necessary fixed charges only exceeded the estimate by approximately 5.9 per cent.

During the year a large number of municipalities in the Bruce Peninsula applied to the Commission for power, and many of them are arranging to submit Hydro By-laws to their electors at the coming municipal elections. It is expected that with nominal rate adjustments and these additional loads the financial operation of this System will be entirely satisfactory.

WASDELL'S SYSTEM

The generating plant of the Wasdell's System differs from the other generating plants supplying power in the Northern District, in that it does not depend on the storage of water for its continuous maximum output, and this characteristic is of considerable value to the municipalities in the Northern District, as all the generating plants in this district, with the exception of the Muskoka System, are tied together, and power may be used to maximum capacity of this plant throughout the day so as to permit the other generating plants in the district to increase their water storage.

The cost of service during the year increased the amount of the power bills as rendered, by \$2,490.01, or 7.7 per cent., due to the fact that the operation and maintenance expenses increased 18.5 per cent., and the interest charges 8.3 per cent., while at the same time the decrease in demand for power for munition plants on the Severn System, cut down the transfer of power to that System. Plans are under way to secure additional load to the capacity of the generating plant.

MUSKOCA SYSTEM

The operation and maintenance expenses of this System increased \$2,235.54, or 26 per cent. over the figure for 1918, and the interest charges increased over the figures for 1918 by \$871.62, or approximately 11 per cent. This large increase in operating expenses with a fixed revenue from the Anglo-Canadian Leather Company, which is being supplied with power under a long-term contract at a rate based on normal operating expenses, resulted in this System operating with a deficit for the year of \$2,469.32.

Arrangements are now being made to increase the amount of power available on this System, for which a demand already exists, which should place the operation of this System on a more satisfactory basis.

ST. LAWRENCE SYSTEM

The operation of this System was first commenced in December, 1913, a contract being made with the M. F. Beach Power Company for 500 horsepower to supply power to the municipalities in this district.

In order to supply the increased loads in the district and to supply power to other municipalities which had made application to the Commission, a contract was made with the Cedar Rapids Transmission Company, this power being delivered at a high-tension station constructed at Cornwall. Power was first received from this new station on May 1st, 1919. This extension increased the capital expenditure from approximately \$180,000 to over \$570,000, and the load supplied in this district increased from less than 500 horsepower to over 2,000 horsepower during the last six months of the year.

The actual cost of operation, maintenance and the necessary fixed charges for the year increased by \$6,078.93, or approximately 11 per cent. The load is growing rapidly and more favourable results are anticipated during 1920.

THUNDER BAY SYSTEM

During the past ten years power has been supplied to Port Arthur by the Commission under a contract for power received from the Kaministiquia Power Company. This contract expires in December, 1920, and at the request of the municipalities in this district, the Commission commenced the construction of a development on the Nipigon River at Cameron's Falls, in the fall of 1918.

The ultimate capacity of this plant will be 75,000 horsepower. The first installation will have a capacity of approximately 30,000 horsepower, and it is expected that the plant will be ready for operation about December 1st, 1920.

RIDEAU SYSTEM

Power was first supplied to this System from the Merrickville plant where the Commission had a contract for 500 horsepower, and while this plant was sufficient to supply the needs of the district during the first year's operation, the rapid growth in the loads of the municipalities supplied necessitated the Commission going ahead with the development of High Falls on the Mississippi River, which development, when completed, will supply approximately 3,000 horsepower. The first unit of this plant will be put into operation about May, 1920.

CENTRAL ONTARIO SYSTEM

Just prior to the signing of the Armistice, this System was fully loaded and the installation of a third generating unit of 3,750 k.v.a. capacity was in progress at Healey Falls in order to meet the increasing demand. When the war terminated, the munitions load fell off abruptly, the decrease being nearly 30 per cent. of the total pre-armistice load. After a period of quiescence, new loads began to develop so that by the beginning of the last quarter of the year normal conditions had again returned. As a consequence of the inactive period the revenues of the Power Department declined by 30 per cent., and of the Local

Systems by 11 per cent. from those of the previous year. Advancing wage rates and material costs resulted in an increase of 12 per cent. in the cost of operation of the Power Department, while the operating costs of the Local Systems declined by 10 per cent. owing to decreased power demand. The fixed charges of the Power Department increased by 12 per cent. owing to completion of the Healey Falls development and, as during the greater part of the year the capacity of the new unit was not required, this increased the burdens of the System without bringing any compensating revenue.

The operation of the Pulp Mill, which had been profitable previously, was conducted at a loss this year owing to low market prices and advancing manufacturing costs. Since the end of the year market conditions have entirely changed and the operations of the mill are now yielding very large profits.

Since August, 1919, the demand for power on this System has increased to such an extent that all available generating plants are fully loaded and construction work on a new 10,000 horsepower development at Ranney's Falls will be commenced this spring.

It is expected that the increased loads will return sufficient revenue to bring about profitable operation in almost all municipalities and that in cases where rate increases are necessary through rising costs, these increases will not be large.

NIPISSING SYSTEM

The increase in loads on this System during the year was such that the demand for power exceeded the capacity of the hydraulic generating plant and necessitated the operation of the steam plant during low-water periods of the year. The operation of this steam plant, with the increased cost of coal as well as the increased cost of operation and maintenance of the plant, seriously handicapped the System and resulted in a net operating loss for the year amounting to \$1,089.53.

The installation of storage dams will be completed some time during the coming summer, so that during periods of high water, the water supply may be stored, and thereby obviate the necessity of operating the steam plant during low water periods, and with this change the operation of the plant should show a good surplus.

The Commission submits its Report with a feeling of satisfaction, knowing full well that its activities have been subjected to an enquiry of the most searching nature, the result of which is a vindication of the policy of public ownership and operation of electrical utilities, and of the Commission's methods of management and operation.

The Commission feels this to be a fitting opportunity of acknowledging the untiring zeal and faithful attention to duty on the part of all officers and members of its staff.

Respectfully submitted,

ADAM BECK,
Chairman.

TORONTO, ONT., February 25th, 1919.

COLONEL SIR ADAM BECK, Kt., LL.D.,

*Chairman, Hydro-Electric Power Commission of Ontario,
Toronto, Ont.*

SIR,—I have the honour to transmit herewith the third volume of the Twelfth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1919.

I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

COLONEL SIR ADAM BECK, Kt., LL.D., Chairman.

HONOURABLE I. B. LUCAS, M.P.P.

LT. COL. HON. D. CARMICHAEL, D.S.O., M.C.

W. W. POPE, Secretary.

F. A. GABY, Chief Engineer.

TWELFTH ANNUAL REPORT
OF THE
**Hydro-Electric Power Commission
of Ontario**

VOLUME III
HYDRAULIC INVESTIGATIONS

STREAM FLOW MEASUREMENTS

The results of the measurements of stream flow in the Province during the year October 1st, 1918, to September 30th, 1919, are published herewith:—

The grouping is under five arbitrary divisions based on the districts covered by the different field offices, and is of no material significance. The sections under the groups are arranged alphabetically as to the names of the rivers as is also the case in the general index.

The year's work has been carried on without change in the personnel of the staff employed and therefore the results have the advantages consequent to such conditions.

The wide variation in the weather in this Province, produces influences on the factors governing the estimates of flow of streams, which are most apparent in the winter, when it is most difficult to secure good discharge measurements, and which at the same time necessitate more frequent measurements than are ordinarily required. Where sufficient measurements have been secured to justify estimates of winter flow, during the period when the sections were affected by ice, such estimates have been made. At some of the stations subject to ice effect, however, no measurements were obtainable, and consequently estimates of flow have not been made for that period. On the other hand, there are sections for which estimates are given over the winter period, during which no measurements were actually made, but where sufficient assurance existed to make such estimates reasonably justifiable. These latter sections are all in the north-western part of the Province.

The winter season embraced by the period of this report was exceptionally mild and entirely unlike the winter preceding. The total run-off is generally higher than that of the preceding year, and yet, as was to have been expected, the maximum run-offs were in nearly every instance lower, and the winter run-off higher.

It is necessary to draw attention to the fact that in the table showing the relation of run-off to precipitation, some of the precipitation stations, though considered the most suitable for the purpose, may possibly give results varying very considerably from the mean precipitation of the basin. The variations in the percentages of run-off to rainfall are attributed partially to this reason.

Altogether, estimates of flow at forty-four stations in the Province are published in this report.

Regular Stations

EASTERN ONTARIO DISTRICT

River	Location	Drainage Area Sq.Miles	Township	County or District
Black	near Washago	585	Rama	Ontario
Bonnechere	at Renfrew	910	Horton	Renfrew
Madawaska.....	at Madawaska	800	Murchison	Nipissing
Maganatawan, north	near Burk's Falls	107	Armour	Parry Sound
" south	" " "	257	"	"
Mississippi	at Appleton	1,150	Ramsay	Lanark
"	at Ferguson's Falls	1,042	Drummond	"
"	at Galetta	1,456	Fitzroy	Carleton
"	near Snow Road	446	Sherbrooke	Lanark
Moira	near Foxboro	1,038	Thurlow	Hastings
Muskoka, south	at Black's Bridge	668	Draper	Muskoka
" north	near Port Sydney	560	Stéphenson	"
Napanee	near Napanee	300	Camden	Addington
Petawawa	near Petawawa	1,572	Petawawa	Renfrew
Tay	near Glen Tay	204	Bathurst	Lanark
York	near Bancroft	374	Faraday	Hastings

Black River near Washago

Location—At the highway bridge known as Kennedy's Bridge, about 5 miles south-east of the Town of Washago, on lot 1, concession G, Township of Rama, County of Ontario.

Records Available—Discharge measurements at first bridge from August, 1913, to January, 1914. Discharge measurements at Kennedy's Bridge from February, 1914, and daily gauge heights from May 5, 1915.

Drainage Area—585 square miles.

Gauge—A bench mark (elevation 30.00), painted on tie-rod on downstream side of bridge, is used in ascertaining the water elevation, by measuring down to the surface of the stream with a graduated staff. This is referred to a bench mark (elevation 32.62) on north-west corner of right abutment.

Channel and Control—The channel is straight for 300 feet above and 1,000 feet below the gauging section. The banks and control can be considered permanent, as the velocity here is never very high. The bed of the stream is composed of rock.

Discharge Measurements—Made from the bridge and wading section 500 feet above bridge at low water.

Winter Flow—Owing to the somewhat sluggish flow at this section, ice from December to March forms to a great thickness, and relation of gauge height to discharge is seriously affected during that period. Measurements are made to determine the winter flow.

Regulation—The flow at this section during May, June and July is controlled to a large extent by logging dams above. The operation of gates at these dams causes fluctuations in gauge heights, amounting to several feet at the gauge. At times logs lodge below section, causing considerable backwater.

Accuracy—For three months in the early summer the river stage is subject to large fluctuations, and the accuracy of the discharge depends upon accuracy of mean daily gauge heights. Rating curve not well defined at all stages.

Observer—Pearl Carrick, Washago.

Discharge Measurements of Black River near Washago for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 9.....		119	662	1.24	23.08	821
Dec. 17.....	Ronald, F.....	119	852	2.08	24.79	1,774
1919						
Feb. 3.....	"	119	562	1.07	23.08	599 (a)
" 18.....	"	110	491	.94	22.46	460 (a)
April 11.....	Hatton, M.....	119	923	2.46	25.42	2,273
" 16.....	Ronald, F.....	119	886	2.14	25.08	1,892
May 20.....	Hatton, M.....	119	729	1.56	23.75	1,136
June 10.....	"	119	739	1.42	23.83	1,049 (b)
July 9.....	"	119	497	.57	21.75	284
Aug. 20.....	"	100	389	.35	20.42	135
Sept. 24.....	Ronald, F.....	45	37	1.27	19.90	47

(a) Ice measurement.

(b) Log jam below section.

Daily Gauge Height in feet, and Discharge in second-feet of Black River near Washago, for year ending September 30th, 1919

No.	Gauge Ht. Feet	Discharge Sec.-ft. Feet	October		November		December		January		February		March		April		May		June		July		August		September		
			Gauge Ht., Feet	Discharge Sec.-ft., Feet																							
			Gauge Ht., Feet	Discharge Sec.-ft., Feet																							
1	21.54	249	22.67	585	23.23	840	25.50	2360	23.25	660	22.40	444	26.85	3390	24.50	1620	23.83	1190	21.38	218	20.65	117	20.29	85			
2	21.52	244	22.81	640	23.02	735	25.52	2370	23.17	625	22.44	458	26.48	3090	24.42	1570	23.73	1130	21.38	218	20.65	117	20.17	78			
3	21.54	249	22.83	650	23.07	760	25.58	2410	23.10	600	22.46	466	26.21	2890	24.92	1920	23.75	1140	21.38	218	20.52	104	20.15	78			
4	21.50	240	22.98	715	23.17	810	25.66	2470	23.00	560	22.44	458	25.92	2670	25.08	2040	23.52	1000	21.33	209	20.46	98	20.10	75			
5	21.79	304	22.28	865	23.42	940	25.92	2570	23.00	560	22.58	510	25.69	2500	25.25	2170	23.68	1100	21.71	286	20.44	96	20.02	71			
6	22.52	525	23.23	840	23.29	870	26.17	2860	22.92	525	22.63	530	25.55	2410	25.17	2110	23.38	920	21.75	295	20.44	96	19.96	68			
7	23.15	800	23.29	870	23.25	850	26.10	2730	22.88	510	22.65	540	25.56	2400	24.92	1920	23.71	1110	21.60	262	20.44	96	19.96	68			
8	23.23	840	23.40	930	23.19	820	25.81	2510	22.84	495	22.54	495	25.52	2370	24.58	1680	23.54	1010	21.54	249	20.21	81	19.94	67			
9	23.06	755	23.46	965	23.08	765	25.33	2150	22.83	491	22.62	525	25.44	2310	24.05	1330	23.75	1140	21.63	269	20.19	80	19.83	62			
10	23.00	725	23.67	1090	23.08	765	25.33	2150	22.77	469	22.60	520	25.31	2210	23.71	1140	24.27	1470	21.54	249	20.19	80	19.85	62			
11	22.85	660	23.67	1090	23.08	765	25.54	2310	22.75	462	22.58	510	25.42	2300	23.79	1160	24.21	1430	21.48	236	20.15	78	19.90	65			
12	22.71	600	23.58	1040	22.96	710	25.73	2450	22.69	441	22.60	520	25.56	2400	24.15	1390	24.10	1360	21.60	262	20.08	74	19.83	62			
13	22.67	585	23.50	990	22.73	610	25.83	2530	22.60	414	22.67	545	25.46	2320	23.92	1240	24.19	1420	21.62	266	19.84	62	19.79	60			
14	22.67	585	23.46	965	23.37	915	25.33	2080	22.67	435	22.71	560	25.38	2270	23.96	1240	24.29	1480	22.00	358	19.92	66	19.79	60			
15	22.58	550	23.38	920	24.52	1640	24.85	1710	22.52	392	22.67	545	25.19	2120	23.79	1160	23.62	1060	22.25	429	20.19	80	19.85	62			
16	22.54	535	23.33	890	24.88	1890	24.38	1410	22.58	510	22.77	585	25.04	2010	23.71	1110	23.56	1020	22.17	406	19.94	67	19.75	58			
17	22.54	535	23.23	840	24.77	1810	24.10	11230	22.52	488	23.52	835	25.54	2380	23.67	1090	23.38	920	21.94	342	20.12	76	19.75	58			
18	22.54	535	23.09	770	24.52	1640	23.81	11050	22.54	495	26.06	2500	25.92	2670	23.63	1070	23.02	735	21.85	319	20.25	83	19.79	60			
19	22.52	525	23.29	870	24.42	1570	23.54	900	22.46	466	26.92	3210	25.96	2700	23.58	1040	22.71	600	21.67	277	20.46	98	19.75	58			
20	22.62	565	23.42	940	24.12	1370	23.42	835	22.30	414	27.70	3840	25.19	2450	25.19	2120	24.62	1710	22.25	429	20.50	102	19.75	58			
21	23.04	745	23.77	1150	24.08	1340	23.25	705	22.30	414	28.29	4310	25.73	2530	23.81	1180	21.96	348	21.35	213	20.56	108	19.75	58			
22	23.00	725	23.77	1150	24.38	1540	23.19	675	22.34	426	28.08	4140	25.52	2370	23.96	1270	21.88	327	21.42	226	20.54	106	19.79	60			
23	23.06	755	23.56	1020	25.29	2200	22.94	575	22.31	417	27.92	4020	25.40	2280	24.29	1480	21.67	277	21.46	222	20.56	108	19.79	60			
24	22.94	700	23.58	1040	25.54	2390	23.12	645	22.40	444	28.00	4080	25.22	2150	24.44	1580	21.69	282	21.29	202	20.62	114	19.90	65			
25	22.94	700	23.46	965	25.21	2140	23.42	785	22.38	438	28.21	4250	25.19	2120	24.62	1710	21.77	299	21.23	193	20.54	106	19.88	64			
26	22.90	680	23.52	1000	23.77	1150	24.08	1340	23.19	935	23.71	438	28.21	4500	24.92	1980	24.50	1620	21.67	277	21.19	186	20.50	102	19.88	64	
27	22.73	610	23.27	860	25.17	2010	23.62	885	22.40	444	27.96	4230	24.81	1840	24.42	1740	21.56	253	21.21	190	20.54	108	19.88	64			
28	22.71	600	23.21	830	25.56	2140	23.42	785	22.38	438	27.88	4220	24.67	1740	24.30	1490	21.50	240	21.04	162	20.38	91	19.88	64			
29	22.86	665	23.28	865	25.31	2210	23.38	765	23.35	500	27.88	4220	24.63	1710	24.00	1290	21.52	244	21.00	156	20.31	87	19.88	64			
30	22.81	640	23.22	835	25.17	2110	23.35	750	23.35	500	27.67	4060	24.58	1680	23.92	1240	21.44	229	20.90	144	20.40	92	19.85	62			
31	22.81	640	23.12	807	25.12	2070	23.33	740	23.35	500	27.35	3890	24.02	1310	20.73	125	20.38	91	20.02	130	....	....	....	....	....

Monthly Discharge of Black River near Washago for the year ending
Sept. 30th, 1919

Drainage Area, 585 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918) ..	840	240	583	1.44	.41	1.00	1.15
November " ..	1,150	585	906	1.97	1.00	1.55	1.73
December " ..	2,390	610	1,400	4.09	1.04	2.39	2.76
January .. (1919)	2,860	575	1,595	4.89	.98	2.73	3.15
February	660	392	481	1.13	.67	.82	.85
March	4,500	444	2,080	7.69	.76	3.56	4.10
April	3,390	1,680	2,345	5.80	2.87	4.01	4.47
May	2,170	1,040	1,448	3.71	1.78	2.48	2.86
June	1,480	229	815	2.53	.39	1.39	1.55
July	429	125	246	.73	.21	.42	.48
August	117	62	91	.20	.11	.16	.18
September	85	58	65	.15	.10	.11	.12
The year	4,500	58	1,008	7.69	.10	1.72	23.40

Bonnechere River at Renfrew

Location—One-half mile below Raglan St., Town of Renfrew, Township of Horton, County of Renfrew.

Records Available—Discharge measurements from September, 1916. Daily gauge readings from November 1, 1916.

Drainage Area—910 square miles.

Gauge—On the right bank of the river at the section, a box chain gauge with nine feet of standard gauge plates. Distance from end of weight to marker is 12.43 feet.

Channel and Control—The channel is straight for 100 feet above and 300 feet below the station, but both above and below the station long sharp curves occur. There is a low clay bank on the right, and a high clay bank on the left. At extreme high water there may be an escape from this channel of some water from higher above the section to points below the section. The bed of the stream is composed of clean small stones.

Regulation—The Round Lake Dam, and the Golden Lake Dam for power purposes, and the dams on the upper river for lumbering purposes have large regulating effects on this river. The power plants in Renfrew, running twenty-four hours to their full capacity, and having little pondage, will not seriously affect the estimate of mean gauge heights.

Observer—R. Dalton, Renfrew.

Discharge Measurements of Bonnechere River at Renfrew for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 29.....	Ronald, F	122	241	2.75	103.25	663 (a)
Mar. 4.....	"	119	214	2.52	102.96	541 (a)
April 1.....	"	132	276	3.34	103.25	923
July 25.....	Hatton, M	120	171	1.75	102.83	298
Sept. 10.....	Ronald, F	119	173	1.69	102.81	292

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet, and Discharge in second-feet of Bonnechere River at Renfrew for year ending 30th September, 1919

Mo.	October		November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Discharge Sec.-ft.																							
	Feet	Sec.-ft.																							
1 102.67	242	103.42	860	103.33	750	104.00	1700	104.08	1840	103.17	575	103.29	705	104.33	2280	104.71	2950	103.50	960	102.83	306	102.42	193		
2 102.50	205	103.25	660	103.17	575	103.92	1580	103.50	960	102.96	384	103.29	705	104.58	2720	104.58	2720	103.17	575	102.50	205	102.58	221		
3 102.83	306	103.50	960	103.35	750	103.50	960	103.92	1580	103.25	660	103.58	1070	104.50	2580	104.67	2880	103.08	482	... .	40	102.67	242	
4 102.58	221	103.50	960	103.42	860	104.00	1700	103.29	705	103.00	410	103.38	1070	104.42	2440	104.67	2880	103.08	482	... .	40	102.50	205	
5 103.25	660	103.58	1070	103.50	960	104.00	1700	103.25	660	103.00	410	103.67	1200	104.33	2280	104.75	3020	102.92	358	102.67	242	102.42	193		
6 103.50	960	103.58	1070	103.33	750	104.00	1700	103.52	985	103.25	660	103.75	1380	104.38	2370	104.08	1840	102.58	221	102.67	242	102.50	205		
7 103.08	482	103.50	960	103.58	1070	104.08	1840	103.17	575	103.33	750	103.87	1500	104.29	2210	104.42	2440	102.83	306	102.57	219	102.58	221		
8 103.08	482	103.08	482	103.58	1070	103.25	660	103.92	1580	103.08	482	102.92	358	103.85	1470	104.33	2280	104.50	2580	102.67	242	102.57	219	102.50	205
9 103.08	482	103.58	1070	103.33	750	103.58	1070	103.29	705	103.00	410	103.38	1070	104.33	2280	104.58	3020	102.50	358	102.58	221	102.79	286		
10 102.67	242	103.42	860	103.33	750	103.75	1320	103.92	1580	103.17	575	104.08	1840	104.25	2140	105.50	4330	102.67	242	102.58	221	102.58	221		
11 102.92	358	103.42	860	103.83	1440	104.00	1700	103.08	482	103.00	410	104.33	2280	104.29	2210	105.25	3890	102.67	242	102.58	221	102.58	221		
12 102.92	358	103.33	750	103.25	660	104.08	1840	103.25	750	103.00	410	104.35	2320	104.39	2390	105.08	3600	102.62	230	102.25	170	102.67	242		
13 102.92	358	103.33	750	103.33	750	104.08	1840	103.08	482	102.92	358	104.19	2040	104.29	2210	104.92	3320	102.33	180	102.25	170	102.50	205		
14 102.92	358	103.33	750	103.42	860	103.67	1200	103.42	860	102.92	358	104.21	2070	104.33	2370	104.75	3020	102.83	306	102.58	221	102.58	221		
15 102.92	358	103.25	660	103.75	1320	103.50	960	103.25	660	103.25	660	103.25	83	306	104.17	2000	104.25	2140	104.38	2370	102.33	180	102.58	221	
16 102.92	358	103.33	750	103.33	750	103.17	575	103.33	750	102.87	328	104.23	2110	104.50	2580	104.17	2000	102.92	358	102.58	221	102.50	205		
17 102.58	221	103.33	750	103.58	1070	103.08	482	103.33	750	103.08	482	104.42	2440	104.46	2510	104.17	2000	102.75	270	102.58	221	102.58	221		
18 102.75	221	103.33	750	103.58	1070	103.25	660	103.33	750	104.38	2370	104.42	2440	104.46	2510	103.83	1440	102.08	154	102.58	221	102.33	180		
19 102.08	154	103.83	1440	103.50	960	103.33	750	103.25	660	103.25	660	104.00	1700	104.33	2280	104.75	3020	102.58	306	102.58	221	102.58	221		
20 102.92	358	103.75	1320	103.42	860	103.08	482	103.17	575	103.75	1320	104.25	2140	104.25	2140	103.75	1320	102.58	221	102.58	221	102.42	193		
21 103.08	482	103.92	1580	103.50	960	103.25	660	103.25	660	103.29	705	104.25	2140	104.25	2140	103.75	1320	102.75	270	102.58	221	102.75	270		
22 102.92	358	103.58	1070	103.50	960	103.70	103.50	960	103.33	750	103.08	482	104.04	2510	105.08	3600	103.58	1070	102.96	384	102.58	221	102.75	270	
23 102.92	358	103.58	1070	103.67	1200	103.25	660	103.33	750	104.00	336	104.25	2140	105.80	9380	103.83	1440	102.58	221	102.50	205	102.67	242		
24 103.00	410	103.58	1070	103.58	1070	103.17	575	103.03	04	446	104.25	2140	104.04	33280	104.06	83	6660	103.88	1520	102.92	358	102.58	221		
25 103.00	410	103.67	1200	103.42	860	103.67	1200	103.25	660	104.42	2440	104.42	2440	105.58	4470	103.83	1440	102.75	270	102.67	242	102.58	221		
26 103.00	410	103.50	960	103.50	960	103.50	960	103.33	750	104.42	2440	104.21	2070	105.17	3750	103.83	1440	102.83	306	102.75	270	102.58	221		
27 103.17	575	103.58	1070	103.67	1200	103.25	660	103.33	750	104.00	482	104.50	2510	105.17	3750	103.83	1440	102.33	180	102.67	242	102.33	180		
28 103.17	575	103.33	750	103.92	1580	103.08	482	103.04	446	104.25	2140	104.46	2510	104.17	2000	103.58	1070	102.37	186	102.50	205	102.25	170		
29 103.17	575	103.42	860	103.83	1440	103.33	750	103.29	705	103.58	1070	104.42	2440	104.50	2580	103.80	1560	102.88	334	102.50	205	102.83	306		
30 103.25	660	103.42	860	103.67	1200	103.29	705	103.58	1070	103.42	860	104.37	2230	105.00	960	102.88	306	102.58	221	102.75	270	102.75	270		
31 103.50	960	... .	102.67	1200	103.33	750	103.33	750	103.83	1440	... .	104.87	3230	105.20	358	102.75	270	102.75	270	102.75	270	102.75	270

Note.—Aug. 3rd, 4th and 17th—water below gauge. Flow probably between 30 and 50 C.F.S.

Monthly Discharge of Bonnechere River at Renfrew for Year ending
Sept. 30th, 1919

Drainage Area, 910 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	960	154	426	1.05	.17	.47	.54
November "	1,580	482	951	1.74	.53	1.05	1.17
December "	1,580	575	970	1.74	.63	1.07	1.23
January (1919)	1,840	482	1,097	2.02	.53	1.21	1.39
February	1,840	397	811	2.02	.44	.89	
March	2,580	270	1,045	2.84	.30	1.15	.93
April	2,510	705	1,910	2.76	.77	2.10	1.33
May	9,580	2,000	2,975	10.53	2.20	3.27	2.34
June	4,330	860	2,186	4.76	.95	2.40	3.77
July	960	154	310	1.05	.17	.34	2.68
August	358	40	219	.39	.04	.24	.39
September.....	358	170	231	.39	.19	.25	.28
The year	9,580	40	1,094	10.53	.04	1.20	16.29

Madawaska River at Madawaska

Location—50 feet above the G.T. Ry. bridge, Canada Atlantic branch, 500 yards east of the Madawaska Station, Township of Murchison, District of Nipissing.

Records Available—Discharge measurements from September, 1915, and monthly thereafter, and gauge readings from September 27, 1915.

Drainage Area—800 square miles.

Gauge—0-3 feet of standard gauge plates secured vertically to pile, three feet west of face of east abutment. 3-9 feet of standard gauge plates secured vertically to ice guard crib of east abutment.

Channel and Control—Channel is straight for about 400 feet above the section, curving slightly to the right under the bridge. The banks are sandy, and not liable to overflow. The bed of the river is soft, and there are some weeds above the section. The point of control is not clearly defined.

Discharge Measurements—Made about fifty feet above gauge from a boat.

Winter Flow—Affected by ice conditions.

Regulation—Lumber interests on the river above the section operate dams for driving purposes.

Accuracy—Open water rating curve for ordinary stages changing slightly.

Observer—G. Wormke, Madawaska.

Discharge Measurements of Madawaska River at Madawaska for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 20.....	Hatton, M.....	88	687	1.11	104.17	765 (a)
1919						
Jan. 30.....	Ronald, F.....	81	570	.98	104.12	558 (a)
Feb. 20.....	"	80	489	.94	103.50	462 (a)
May 2.....	"	103	1,016	1.76	107.58	1,784
June 2.....	"	102	1,217	1.85	108.92	2,257
" 3.....	"	102	1,185	1.84	108.58	2,179
July 23.....	Hatton, M.....	77	475	.66	101.83	313
Aug. 26.....	"	76	482	.40	101.52	194
Sept. 26.....	"	74	435	.39	101.33	170

(a) Ice measurement

TWELFTH ANNUAL REPORT OF THE

Daily Gauge Height in feet, and Discharge in second-feet, of Madawaska River at Madawaska for year ending
September 30th, 1919

Gauge Ht. Sec-ft.	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1 103.56	620	104.67	890	104.58	865	106.42	1160	103.92	520	103.68	410	104.83	880	107.52	1780	110.84	280	103.23	545	101.69	233	101.42	184	
2 103.29	555	104.60	870	104.84	935	106.69	1240	103.92	520	103.08	410	104.62	825	107.62	1820	109.21	2380	103.17	530	101.62	220	101.42	184	
3 103.27	550	104.52	850	104.66	890	106.75	1250	103.92	520	103.10	414	104.56	810	107.62	1820	108.54	2140	103.17	530	101.58	212	101.35	171	
4 103.17	530	104.50	845	104.68	845	106.58	1200	103.92	520	103.10	414	104.42	775	107.50	1780	108.94	1960	103.17	530	101.58	212	101.33	167	
5 103.38	575	104.50	845	104.54	855	106.50	1180	103.92	520	103.17	428	104.50	845	107.50	1780	109.72	1920	103.08	510	101.56	209	101.33	167	
6 104.45	835	104.50	845	104.92	955	106.50	1180	103.92	520	103.10	414	104.75	910	107.50	1780	107.92	1920	103.00	494	101.56	209	101.33	167	
7 104.83	930	104.50	845	105.58	1140	106.50	1180	103.85	505	103.00	394	104.90	950	107.48	1770	107.92	1920	102.73	440	101.56	209	101.33	167	
8 104.92	955	104.50	845	104.88	945	106.27	1110	103.73	480	103.00	394	105.29	1060	107.69	1840	108.67	2180	102.67	428	101.53	203	101.33	167	
9 104.92	955	104.50	845	104.33	895	106.22	1010	103.50	434	103.00	394	105.42	1100	107.73	1866	109.21	2380	102.67	428	101.43	185	101.32	184	
10 104.75	910	104.50	845	104.21	775	105.83	985	103.42	418	103.00	394	105.72	1190	107.75	1860	109.75	2580	102.56	406	101.42	184	101.33	167	
11 104.75	910	104.62	875	104.96	965	105.83	985	103.46	486	103.15	424	106.58	1450	107.75	1860	110.21	2750	102.42	378	101.36	173	101.33	167	
12 104.75	910	104.00	1270	105.83	985	105.30	994	103.50	494	103.00	410	107.08	1630	107.73	1860	109.38	2440	102.42	378	101.42	184	101.33	167	
13 104.75	920	105.58	1140	104.70	900	106.02	1040	103.50	494	103.02	398	107.68	1630	107.67	1830	108.80	2230	102.42	378	101.42	184	101.29	160	
14 104.81	925	105.42	1100	104.48	840	105.75	965	103.50	494	103.00	394	107.08	1630	107.67	1830	109.76	1940	102.33	369	101.35	171	101.27	157	
15 104.75	910	105.08	1000	104.25	785	105.48	895	103.50	494	103.00	394	106.92	1570	107.23	1680	107.38	1730	102.33	360	101.33	167	101.25	153	
16 104.71	900	104.52	850	104.15	760	105.75	965	103.44	482	103.03	462	107.12	1640	107.08	1630	107.17	1660	102.33	360	101.33	167	101.25	153	
17 104.67	890	104.12	755	104.17	765	105.75	965	103.33	460	103.30	515	107.25	1690	107.07	1660	106.88	1560	102.17	360	101.33	167	101.25	153	
18 104.75	910	103.96	715	104.17	765	104.96	760	103.44	482	103.88	645	107.58	1800	106.92	1570	106.12	1310	101.89	272	101.60	216	101.25	153	
19 104.75	910	104.33	805	104.17	765	104.75	710	103.29	452	104.27	740	108.00	1950	106.92	1570	105.67	1170	101.69	233	101.77	248	101.23	149	
20 104.75	910	104.58	865	104.04	735	104.71	700	103.33	460	104.31	750	108.17	2010	106.87	1550	104.67	890	101.67	229	101.83	260	101.19	142	
21 104.75	910	104.58	865	104.15	690	103.65	690	103.42	478	104.75	860	108.25	2040	107.16	1660	107.77	2175	101.71	237	101.77	248	101.17	139	
22 104.75	910	104.58	865	104.67	890	104.56	665	103.42	478	104.79	870	108.17	2010	107.70	1840	103.92	765	102.00	294	101.83	260	101.17	139	
23 104.64	880	104.50	845	105.04	935	104.48	645	103.42	478	104.81	875	108.68	1980	109.13	2350	103.92	765	102.00	294	101.81	256	101.25	153	
24 104.57	865	104.48	840	105.54	1070	104.50	650	103.42	478	104.81	875	107.92	1920	110.21	2750	103.85	690	102.00	294	101.71	237	101.25	153	
25 104.50	845	104.42	825	105.96	1200	104.33	610	103.33	460	104.75	860	107.87	1900	110.67	2920	103.83	685	102.00	294	101.67	229	101.29	160	
26 104.50	845	104.31	800	106.00	1150	104.33	610	103.33	460	104.56	810	107.81	1880	110.75	2950	103.75	665	101.75	248	101.67	229	101.33	167	
27 104.44	830	104.31	800	106.00	1150	104.33	610	103.29	452	105.42	1040	107.75	1860	111.21	3110	103.75	665	101.75	244	101.67	229	101.33	167	
28 104.50	845	104.33	805	106.00	1150	104.29	600	103.19	432	105.40	1030	107.69	1840	111.42	3190	103.50	605	101.75	244	101.52	202	101.33	167	
29 104.58	865	104.33	805	106.14	1130	104.15	570	....	....	105.67	1110	107.58	1800	111.42	3190	103.33	565	101.75	244	101.50	198	101.33	167	
30 104.56	860	104.38	815	106.25	1160	104.10	560	....	....	105.42	1040	107.58	1800	111.08	3070	103.33	565	101.75	244	101.48	194	101.33	167	
31 104.67	890	....	106.25	1160	103.96	525	....	....	105.12	955	....	....	110.58	2880	....	....	101.75	244	101.42	184	....	....	....	....

Monthly Discharge of Madawaska River at Madawaska for year ending
September 30th, 1919

Drainage Area, 800 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ... (1918)	955	530	840	1.19	.66	1.05	1.21
November. “	1,270	715	872	1.59	.89	1.09	1.22
December “	1,200	705	936	1.50	.88	1.17	1.35
January .. (1919)	1,250	525	873	1.56	.66	1.09	1.26
February	520	418	481	.65	.52	.60	.62
March	1,110	394	630	1.39	.49	.79	.91
April	2,040	775	1,512	2.55	.97	1.89	2.11
May	3,190	1,550	2,095	3.99	1.94	2.62	3.02
June	2,980	565	1,556	3.72	.71	1.94	2.16
July	545	229	355	.68	.29	.44	.51
August	260	167	209	.32	.21	.26	.30
September	184	139	163	.23	.17	.20	.22
The year	3,190	139	878	3.99	.17	1.10	14.93

Maganatawan River (North Branch) near Burk's Falls

Location—One-half mile north of Burk's Falls station, 200 feet upstream from the Grand Trunk Railway bridge, on lot 7, concession 10, Township of Armour, District of Parry Sound.

Records Available—Monthly discharge measurements from June, 1915. Daily gauge readings from August 1, 1915.

Drainage Area—107 square miles.

Gauge—Vertical steel staff with enamelled face fastened to a 2 x 4 scantling and connected to a wooden platform on the right shore about 250 feet above G.T.R. bridge. Zero of the gauge (elev. 28.14 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of 5-ft. iron pipe 20 feet above gauging station, and a bench mark (elevation 49.53) painted on upstream side of right abutment of G.T.R. bridge.

Channel and Control—Straight for about 200 feet above and 100 feet below the gauging station to the falls. The banks are high and wooded, and are not liable to overflow. The bed of the stream is composed of clay and a few rocks, practically permanent. The velocity is moderate.

Discharge Measurements—Made by wading with a small Price current meter, in high water just above gauge, in low water 150 feet below gauge.

Winter Flow—Relation of gauge height to discharge is slightly affected by ice. Measurements are taken to determine the winter flow.

Accuracy—The rating curve is fairly well defined for lower gauge readings.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganatawan River (North Branch) near Burk's Falls for year ending 30th September, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 1.....	Ronald, F.....	73	153	.76	29.97	117(a)
" 19.....	"	73	139	.72	29.72	100(a)
April 14.....	"	89	662	1.03	32.43	684
" 14.....	"	89	662	1.02	32.43	678
July 10.....	"	35	58	.67	29.14	39
Sept. 25.....	"	42	75	.87	29.74	64

(a) Ice measurement.

Daily Gauge Height in feet, and Discharge in second-feet, of Maganatawan River (North Branch) near Burk's Falls for

year ending September 30th, 1919

4. H. E. _(iii)	October	November	December	January	February	March	April	May	June	July	August	September
	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.	Gauge Ht.
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1 29.85 122	30.89 326	30.52 246	30.81 307	29.89 111	29.56 66	32.43 795	31.43 462	31.64 525	29.43 63	28.97 63	29.45 31	29.45 65
2 29.89 128	30.81 307	30.52 246	30.72 288	29.89 111	29.56 66	32.47 810	31.39 450	31.14 386	29.43 63	28.97 31	29.43 29.41	29.43 63
3 29.93 135	30.72 288	30.47 236	30.64 271	29.89 111	29.56 66	32.49 815	31.39 450	30.97 345	29.43 63	28.97 31	29.41 29.41	29.41 61
4 29.97 142	30.68 280	30.43 227	30.56 255	29.89 111	29.54 64	32.51 825	31.43 462	30.64 271	29.45 65	28.95 30	29.37 29.37	29.37 57
5 30.76 187	30.64 271	30.39 219	30.47 215	29.89 111	29.56 66	32.47 810	31.39 450	30.56 255	29.47 67	28.93 29	29.35 29.35	29.35 55
6 30.85 316	30.60 263	30.35 203	30.35 192	29.87 108	29.56 66	31.14 386	31.06 366	30.54 250	29.49 69	28.91 28	29.33 29.33	29.33 53
7 30.93 335	30.62 267	30.26 194	30.24 172	29.85 105	29.56 66	31.22 406	31.33 440	30.52 246	29.45 65	28.87 27	29.33 29.33	29.33 53
8 30.97 345	30.64 271	30.26 194	30.18 161	29.81 99	29.56 66	31.47 473	31.31 430	30.56 255	29.22 44	28.85 27	29.35 29.35	29.35 55
9 30.91 357	30.72 288	30.39 219	30.47 215	29.89 111	29.56 66	31.56 499	31.31 430	30.81 307	29.14 39	28.85 27	29.37 29.37	29.37 57
10 31.02 357	30.81 307	30.24 190	30.06 140	29.81 99	29.56 66	31.72 545	31.14 386	30.72 288	29.14 39	28.83 27	29.33 29.33	29.33 59
11 31.02 357	30.76 297	30.22 187	30.10 147	29.81 99	29.56 66	32.06 660	30.93 335	30.64 271	29.14 39	28.83 27	29.41 29.41	29.41 61
12 31.04 362	30.76 297	30.22 187	30.10 147	29.81 99	29.56 66	32.14 685	30.81 307	30.60 263	29.10 37	28.81 26	29.42 29.42	29.42 62
13 31.01 357	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.39 780	31.31 430	30.56 255	29.02 35	28.81 26	29.47 29.47	29.47 67
14 31.01 357	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.39 780	31.31 430	30.56 255	29.02 35	28.81 26	29.47 29.47	29.47 67
15 30.91 330	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.43 795	30.68 307	30.52 246	29.02 35	28.81 26	29.47 29.47	29.47 67
16 30.87 321	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.62 795	30.68 307	30.52 246	29.02 35	28.87 27	29.47 29.47	29.47 67
17 30.81 307	30.76 297	30.22 187	30.10 147	29.81 99	29.56 66	32.71 803	32.14 203	30.43 227	29.04 34	28.89 28	29.49 29.49	29.49 69
18 30.79 303	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.86 660	32.06 236	30.26 194	29.04 34	28.91 28	29.49 29.49	29.49 69
19 30.74 292	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	32.99 675	32.10 255	30.62 267	30.06 158	28.94 34	28.99 32	28.99 69
20 30.70 284	30.76 297	30.14 172	30.10 147	29.81 99	29.56 66	33.14 685	32.14 207	30.97 142	29.04 34	29.10 32	29.56 29.56	29.56 78
21 30.68 280	30.68 280	30.14 172	30.10 147	29.81 99	29.56 66	33.31 750	30.64 271	30.52 246	29.02 35	28.81 33	29.14 29.14	29.14 69
22 30.72 288	30.60 263	30.47 236	30.22 187	29.81 99	29.56 66	33.49 780	32.39 780	30.81 307	29.02 34	29.35 33	29.35 29.35	29.35 71
23 30.72 288	30.60 263	31.22 406	30.18 179	29.81 99	29.56 66	33.56 780	32.35 780	32.47 810	29.04 34	29.39 31	29.39 29.39	29.39 71
24 30.74 292	30.56 255	31.31 430	30.14 172	29.81 99	29.56 66	33.75 660	32.06 236	32.26 194	29.04 34	29.45 31	29.45 29.45	29.45 74
25 30.76 297	30.51 244	31.39 450	29.93 118	29.64 75	32.06 660	31.89 600	32.72 910	29.76 107	28.95 30	29.45 30	29.45 29.45	29.45 78
26 30.79 303	30.49 240	31.39 450	29.91 115	29.62 73	32.31 750	30.76 297	29.93 135	29.02 33	29.45 30	28.95 30	29.45 29.45	29.45 74
27 30.81 307	30.43 227	30.35 430	29.93 118	29.68 80	32.39 750	32.47 810	29.91 132	29.02 33	29.47 31	28.95 30	29.47 29.47	29.47 71
28 30.88 323	30.41 223	31.31 430	29.93 125	29.58 68	32.28 740	31.64 525	32.56 845	28.97 31	29.47 31	28.95 30	29.47 29.47	29.47 69
29 30.89 326	30.43 227	31.26 417	29.95 122	32.35 765	31.56 699	32.31 750	29.49 115	29.04 34	29.45 31	28.95 30	29.45 29.45	29.45 69
30 30.93 335	30.47 236	31.06 366	29.95 122	32.35 765	31.47 473	32.66 660	29.49 115	29.04 34	29.45 31	28.97 30	29.45 29.45	29.45 69
31 30.97 346	30.97 345	30.97 345	29.95 122	32.35 765	31.47 473	32.66 660	29.49 115	29.04 34	29.45 31	28.97 30	29.45 29.45	29.45 69

Monthly Discharge of Maganatawan River (North Branch) near Burk's Falls for year ending Sept. 30th, 1919

Drainage Area, 107 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	362	122	291	3.38	1.14	2.72	3.14
November	326	223	275	3.05	2.08	2.57	2.87
December	450	172	261	4.21	1.61	2.44	2.81
January (1919)	307	111	159	2.87	1.04	1.49	1.72
February	111	68	93	1.04	.64	.87	.91
March	780	64	294	7.29	.60	2.75	3.17
April	825	366	642	7.71	3.42	6.00	6.69
May	910	263	491	8.50	2.46	4.59	5.29
June	525	66	212	4.91	.62	1.98	2.21
July	69	30	41	.64	.28	.38	.44
August	67	26	40	.63	.24	.37	.43
September	78	51	65	.73	.48	.61	.68
The year	910	26	239	8.50	.24	2.24	30.35

Maganatawan River (South Branch) near Burk's Falls

Location—One-half mile south of Burk's Falls station, and 200 feet east of G.T. Ry. tracks on lot 8, concession 8, Township of Armour, Parry Sound District.

Records Available—Discharge measurements from June, 1915. Daily gauge heights from August 1, 1915.

Drainage Area—257 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened to 2 x 8 scantling wedged between two hardwood trees on the left shore 200 feet above low water gauging station. Zero of the gauge (elev. 22.14 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of a 5-ft. iron pipe located near the gauge on the north branch of the river, and a bench mark (elevation 29.77), which is the head of a nail driven horizontally in one of the trees to which gauge is fastened.

Channel and Control—Straight for about 250 feet above and 100 feet below to the rapids. The banks are high and wooded, and are not liable to overflow. The current is moderate.

Discharge Measurements—Made by wading with a small Price meter and from G.T.R. bridge, 1,500 feet below gauge.

Winter Flow—Relation of gauge height to discharge is but slightly affected by ice. Measurements are taken to determine the winter flow.

Regulation—Temporary dams above, which are used during log driving season, cause fluctuations at the gauge.

Accuracy—Rating curve only fairly well defined.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 19	Ronald, F	79	476	.66	24.39	313 (a)
1919						
Feb. 1 .....	.. ..	71	117	2.56	24.31	300 (a)
Mar. 19 .....	.. ..	76	493	.74	24.47	363
Apr. 12 .....	.. ..	80	540	1.76	25.93	953
Apr. 14 .....	.. ..	85	584	1.83	26.06	1,067
May 21 .....	.. ..	80	525	1.23	25.31	647
June 11 .....	.. ..	85	488	1.19	25.14	580
July 10 .....	.. ..	72	81	2.15	23.78	174
Aug. 21 .....	.. ..	69	305	.44	23.64	133

(a) Ice measurement.

Daily Gauge Height in feet, and Discharge in second-feet, of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September	
Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1 23.81	182	25.12	550	24.81	443	24.85	455	24.85	455	24.85	455	24.85	455	24.85	455	24.85	455	24.85	455	24.85	455	24.85	455
2 23.85	190	25.14	555	24.87	451	24.87	456	24.87	455	24.87	456	24.87	455	24.87	456	24.87	455	24.87	456	24.87	455	24.87	456
3 23.89	198	25.14	565	24.87	461	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455
4 23.97	216	25.14	555	24.87	461	24.85	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455	24.87	455
5 24.81	443	25.06	525	24.85	455	24.83	449	24.85	455	24.83	449	24.83	449	24.83	449	24.83	449	24.83	449	24.83	449	24.83	449
6 25.10	540	25.02	510	24.85	455	24.81	443	24.85	455	24.81	443	24.85	455	24.81	443	24.85	455	24.81	443	24.85	455	24.81	443
7 25.10	540	25.02	510	24.83	449	24.72	416	24.26	288	23.99	221	25.64	780	25.89	935	25.39	660	24.02	228	23.62	147	23.58	139
8 24.97	494	25.06	525	24.24	283	24.70	410	24.22	283	23.99	221	25.64	780	25.89	935	25.39	600	24.02	228	23.62	147	23.58	139
9 24.89	467	25.10	540	24.18	268	24.64	392	24.24	283	23.97	216	25.68	805	25.62	770	25.31	625	23.95	190	23.60	143	23.56	136
10 27.76	428	25.12	550	24.10	248	24.62	386	24.24	283	24.01	225	25.81	880	25.52	720	25.47	695	23.79	178	23.60	143	23.58	139
11 24.64	392	25.12	550	24.10	248	24.56	368	24.22	278	24.06	238	25.89	935	25.47	695	25.14	555	23.76	172	23.58	139	23.60	143
12 24.56	368	25.10	540	24.08	243	24.52	356	24.20	273	24.14	258	25.93	960	25.47	695	25.14	555	23.74	169	23.56	136	23.60	143
13 24.60	380	25.08	535	24.14	258	24.54	362	24.16	263	24.22	278	25.97	985	25.06	695	25.06	555	23.72	165	23.56	136	23.58	139
14 24.64	392	25.06	525	24.26	288	24.56	368	24.14	258	24.24	283	26.06	1040	25.49	705	25.02	510	23.72	165	23.54	132	23.53	130
15 24.68	404	25.06	525	24.31	301	24.54	362	24.16	263	24.28	293	26.14	1090	25.52	720	24.89	467	23.70	161	23.54	132	23.47	120
16 24.70	410	25.01	510	24.35	311	24.47	342	24.16	263	24.28	293	26.14	1090	25.52	720	24.93	493	23.70	161	23.54	132	23.47	120
17 24.70	416	25.01	510	24.37	316	24.49	347	24.22	278	24.39	321	26.22	1140	25.52	720	24.81	443	23.70	161	23.56	136	23.44	116
18 24.76	428	24.99	500	24.37	316	24.47	342	24.31	301	24.45	337	26.31	1200	25.52	720	24.72	416	23.70	161	23.55	139	23.40	110
19 24.81	443	24.97	494	24.39	321	24.43	332	24.33	306	24.47	342	26.35	1230	25.52	720	24.47	342	23.70	161	23.60	143	23.06	54
20 24.79	437	24.97	494	24.39	321	24.43	332	24.35	311	24.64	392	26.39	1250	25.56	740	24.26	288	23.70	161	23.62	147	23.79	120
21 24.76	428	24.95	488	24.43	332	24.41	327	24.37	316	24.81	443	26.47	1300	25.60	760	24.22	278	23.68	157	23.64	150	23.41	109
22 24.79	437	24.91	474	24.41	327	24.45	337	24.31	301	24.81	443	26.56	1360	25.60	760	24.14	258	23.68	157	23.64	150	23.57	138
23 24.81	443	24.85	455	24.97	494	24.39	321	24.33	306	24.89	467	26.60	1390	25.62	770	24.10	248	23.64	150	23.72	165	23.61	145
24 24.83	449	24.83	449	24.97	494	24.41	327	24.31	301	24.97	494	26.67	1400	25.60	760	24.06	238	23.62	147	23.76	172	23.56	136
25 24.85	455	24.81	443	24.81	443	24.43	332	24.28	393	24.28	393	26.56	1250	25.56	740	24.06	238	23.62	147	23.76	172	23.56	136
26 24.88	467	24.81	443	24.81	443	24.22	288	24.16	288	24.16	288	26.31	1200	25.54	730	24.01	226	23.62	147	23.76	172	23.56	136
27 24.95	488	24.76	428	24.91	474	24.81	327	24.35	311	24.81	443	26.56	1200	25.56	740	24.01	226	23.60	143	23.76	172	23.56	136
28 24.97	494	24.72	416	24.72	416	24.14	332	24.18	268	24.55	332	26.26	1170	25.64	780	24.01	226	23.60	143	23.74	169	23.58	139
29 25.02	510	24.74	422	25.16	565	24.41	327	24.32	327	24.54	327	26.22	1140	25.68	805	23.99	221	23.56	136	23.74	169	23.60	143
30 25.04	520	24.76	428	25.06	525	24.39	321	24.39	321	24.54	327	26.14	1090	25.72	860	23.97	216	23.57	129	23.72	165	23.62	147
31 25.06	525	24.76	428	24.76	428	25.06	525	24.39	321	24.39	321	24.54	327	25.76	860	23.97	216	23.57	129	23.72	165	23.62	147

Monthly Discharge of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

Drainage Area, 257 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	540	182	419	2.10	.71	1.63	1.88
November "	565	416	500	2.20	1.62	1.95	2.18
December "	590	243	407	2.30	.95	1.58	1.82
January ..(1919)	455	321	369	1.77	1.25	1.44	1.66
February	321	248	291	1.25	.96	1.13	1.18
March	715	216	377	2.78	.84	1.47	1.70
April.....	1,390	740	1,039	5.41	2.88	4.04	4.51
May.....	1,070	695	800	4.16	2.70	3.11	3.58
June	780	216	463	3.04	.84	1.80	2.01
July.....	228	123	170	.89	.48	.66	.76
August	178	132	151	.69	.51	.59	.68
September	161	46	128	.63	.18	.50	.56
The year	1,390	46	426	5.41	.18	1.66	22.50

Mississippi River at Appleton

Location—At the highway bridge in the Village of Appleton, between lots 3 and 4, concession 10, Township of Ramsay, County of Lanark.

Records Available—Discharge measurements from September, 1918, and gauge readings from September 20th, 1918.

Drainage Area—1,150 square miles.

Gauge—0 to 6 feet of standard gauge plates fastened to tree on right bank of river one-quarter mile above section.

Channel and Control—Channel is straight for 150 feet above and 350 feet below the section. The banks are fairly high and not liable to overflow. The bed of the river is composed of solid rock and will not shift. There are three channels formed by the bridge piers, at all stages. The Caldwell Woollen Mills dam is about 350 feet downstream.

Discharge Measurements—Made from the bridge with small Price current meter. Measurements are made by wading at bridge during low stages.

Winter Flow—Discharge relations affected by ice, particularly frazil ice.

Regulation—Storage dams for power and lumbering purposes are located on the upper part of the river.

Co-operation—The Mississippi River Improvement Co. co-operate in the maintenance of this section.

Observer—George Buchanan, Appleton.

Discharge Measurements of Mississippi River at Appleton for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 2.....	Ronald, F.	215	473	2.50	2.33	1,181 (a)
1919						
Jan. 20.....	"	215	382	3.41	2.04	1,301 (a)
Feb. 12.....	"	215	425	2.65	1.75	1,126 (a)
Mar. 6.....	"	215	421	2.70	1.79	1,008 (a)
" 27.....	"	215	638	5.77	3.73	3,689
April 28.....	"	215	641	5.81	3.75	3,724
May 7.....	"	215	684	5.53	3.67	3,782
" 31.....	"	215	734	8.40	4.92	6,166
June 10.....	Hatton, M.	215	684	6.20	3.96	4,239
" 19.....	Ronald, F.	215	490	5.32	2.87	2,605
July 26.....	Hatton, M.	215	468	1.21	1.33	568
Aug. 8.....	"	215	231	1.20	.92	278
Sept. 6.....	Ronald, F.	215	511	1.10	.35	564

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Mississippi River at Appleton for year ending
September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September					
Gauge Ht.	Discharge																										
Feet	Sec-It.																										
1	1.28	545	1.80	1040	1.82	1060	2.54	1660	2.14	1300	1.52	760	4.33	4960	3.58	3560	4.78	880	1.81	1050	1.11	398	.88				
2	1.28	545	1.71	950	2.07	1440	2.28	1600	2.13	970	4.00	4300	3.63	3640	4.63	5560	1.85	1100	1.27	535	1.14	216	216				
3	1.27	535	1.58	820	2.07	1340	2.25	1590	2.00	1150	2.00	4280	3.99	3590	4.49	5280	1.81	1050	1.02	326	1.23	424	424				
4	1.26	525	1.73	970	1.89	1140	2.25	1550	1.79	1030	1.79	1030	3.97	4250	3.55	3550	4.42	5140	1.73	970	1.04	342	1.22	500	500		
5	1.26	525	1.80	1040	1.97	1230	2.29	1600	1.78	1020	1.79	1030	3.88	4080	3.57	3540	4.22	4740	1.60	840	1.26	525	1.21	492	492		
6	1.02	326	1.81	1050	2.02	1280	2.35	1680	1.77	1010	1.77	1010	3.80	3940	3.61	3610	4.08	4460	1.47	715	1.29	550	1.19	466	466		
7	1.26	525	1.81	1050	2.10	1370	2.28	1590	1.75	990	1.75	990	3.78	3900	3.65	3680	3.93	4170	1.54	780	1.28	545	1.95	270	270		
8	1.43	675	1.77	1010	1.71	950	2.21	1500	1.76	1000	1.76	1000	3.77	3890	3.62	3650	3.79	3920	1.56	800	1.25	520	1.23	500	500		
9	1.46	705	1.87	1120	1.78	1020	2.18	1470	1.57	810	1.48	820	3.75	3850	3.61	3590	3.76	3870	1.58	820	1.16	441	1.38	630	630		
10	1.51	750	1.65	890	1.94	1190	2.07	2010	1.79	1030	1.73	970	3.78	3900	3.57	3540	3.70	3760	1.59	830	.99	302	1.30	560	560		
11	1.47	715	1.69	930	2.33	1410	2.61	2020	1.81	1050	1.67	910	3.84	4010	3.60	3590	3.62	3620	1.48	720	1.17	450	1.29	550	550		
12	1.47	715	1.82	1060	2.01	1270	2.13	1410	1.72	960	1.67	910	3.86	4050	3.65	3550	3.55	3500	1.42	670	1.25	520	1.27	535	535		
13	1.42	670	1.86	1110	1.75	990	2.57	1830	1.65	890	1.60	840	3.92	4160	3.65	3680	3.48	3390	1.23	500	1.18	458	458	500	500		
14	1.40	675	1.79	1030	1.86	1110	2.31	1620	1.69	930	1.61	850	4.01	4320	3.61	3610	3.38	3220	1.07	366	1.23	500	1.94	262	262		
15	1.62	860	1.77	1010	1.75	990	2.11	1380	1.73	970	1.59	830	4.02	4340	3.62	3620	3.25	3000	1.45	695	1.24	510	1.17	450	450		
16	1.62	860	1.73	970	1.98	1240	2.02	1280	1.54	780	1.43	675	4.08	4460	3.63	3640	3.17	2860	1.43	675	1.04	342	1.21	484	484		
17	1.61	850	1.56	800	2.03	1290	2.04	1300	2.15	1200	1.63	870	4.21	4620	3.70	3760	3.07	2700	1.44	685	.92	246	1.21	484	484		
18	1.57	810	1.74	980	2.04	1300	1.97	1230	1.62	860	2.06	1330	4.18	4660	3.58	3560	2.98	2570	1.40	650	1.18	458	1.25	520	520		
19	1.59	830	1.82	1060	2.06	1330	1.86	1110	1.71	950	2.35	1680	4.17	4640	3.56	3520	2.88	2340	1.35	605	1.27	535	1.25	520	520		
20	1.43	675	1.88	1130	2.11	1380	1.95	1200	1.60	840	2.38	1710	4.12	4540	3.59	3570	2.62	2040	1.13	416	1.21	484	1.14	324	324		
21	1.52	760	1.93	1180	2.10	1370	1.94	1280	2.02	1190	2.52	1900	4.07	4440	3.61	3610	2.54	1930	1.40	650	1.26	525	1.94	262	262		
22	1.61	850	1.91	1160	2.03	1290	1.91	1160	1.56	800	2.89	2440	4.04	4380	3.71	3780	2.48	1840	1.41	660	1.24	510	1.19	466	466		
23	1.56	800	1.98	1240	2.31	1620	1.90	1150	1.40	650	2.89	2440	4.02	4340	4.05	4400	2.43	1780	1.44	685	1.15	432	1.24	510	510		
24	1.57	810	1.89	1140	2.25	1550	1.94	1150	1.60	840	3.17	2860	3.98	4260	4.17	4640	2.29	1600	1.41	660	.94	262	1.25	520	520		
25	1.51	750	1.98	1240	2.20	1490	1.57	810	1.57	1050	1.57	1050	3.86	3180	3.36	3180	4.38	5060	4.19	666	1.34	595	1.18	466	466		
26	1.47	715	2.02	1280	2.32	1640	1.81	1050	1.57	810	3.33	3470	3.79	3920	4.38	5170	2.82	1110	1.34	595	1.23	500	1.28	545	545		
27	1.27	535	1.97	1230	2.34	1660	1.98	1240	1.57	810	3.73	3810	3.75	3850	4.90	6140	1.79	1030	1.23	500	1.27	535	1.17	450	450		
28	1.55	790	1.84	1080	2.34	1660	1.93	1180	1.53	770	3.85	4030	3.74	3830	5.04	6450	1.78	1020	1.27	535	1.23	500	.94	262	262		
29	1.70	940	1.97	1230	2.23	1530	1.89	1140	1.43	840	4.13	4560	3.68	3730	5.07	6510	1.82	1060	1.27	535	1.21	484	1.10	390	390		
30	1.69	930	1.92	1170	2.23	1530	1.95	1200	2.00	1160	3.60	3590	5.01	6380	1.79	1030	1.28	545	1.11	398	1.28	545	1.21	398	398		
31	1.78	1020	1.97	1230	2.58	1840	1.97	1230	1.55	770	3.90	4120	4.92	6180	4.92	6180	4.92	6180	4.92	6180	1.30	592	1.30	592	1.30	592	592

Monthly Discharge of Mississippi River at Appleton for year ending
September 30th, 1919

Drainage Area, 1,150 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ... (1918)	1,020	326	716	.89	.28	.62	.72
November	1,280	800	1,066	1.11	.70	.93	1.04
December	1,840	950	1,339	1.60	.83	1.16	1.34
January ... (1919)	2,140	1,050	1,435	1.86	.91	1.25	1.44
February	1,300	650	930	1.13	.57	.81	.84
March	4,560	675	1,849	3.97	.59	1.61	1.86
April	4,960	3,590	4,188	4.31	3.12	3.64	4.06
May	6,510	3,500	4,225	5.66	3.04	3.67	4.23
June	5,880	1,020	2,987	5.11	.89	2.60	2.90
July	1,100	366	692	.96	.32	.60	.69
August	550	246	448	.48	.21	.39	.45
September	630	216	454	.55	.19	.39	.44
The year	6,510	216	1,694	5.66	.19	1.47	20.00

Mississippi River at Ferguson's Falls

Location—At the bridge on the road through the Village of Ferguson's Falls, near lots 16 and 17, concession 12 Township of Drummond, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings from July 13, 1915.

Drainage Area—1,042 square miles.

Gauge—0 to 6 feet of standard gauge plates secured to the downstream side of second pier from the right bank. Zero of gauge 100.12.

Channel and Control—Channel is straight for 300 feet above and $\frac{1}{2}$ mile below the gauging station. The banks are not liable to overflow. There are, at present, 11 channels formed by old and new bridge piers. When the old piers are removed there will be 6 channels formed by new bridge piers. The present control is a short distance below the section, and ice action there will affect the discharge relation at low winter stages, but this will not be the point of control for high-water stages. At certain stages measurements are made 1,500 feet below bridge.

Winter Flow—Discharge relation is affected by ice.

Regulation—The river is regulated throughout its length by power and storage dams, as well as dams in connection with the timber industry.

Accuracy—Section is affected by piers of old bridge, which have not yet been removed.

Observer—A. M. Sheppard, Ferguson's Falls.

Discharge Measurements of Mississippi River at Ferguson's Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 2.....	Ronald, F	242	403	2.66	101.85	1,071(a)
1919						
Jan. 21.....	"	199	357	2.88	101.92	1,027(a)
Feb. 12.....	"	188	328	2.10	101.67	690(a)
Mar. 27.....	"	216	773	5.08	103.75	3,929(b)
May 30.....	"	202	933	5.58	104.54	5,218
June 20.....	"	202	516	3.92	102.50	2,023
Sept. 7.....	"	221	263	1.51	101.27	397

(a) Ice measurement.

(b) Ice below section.

Daily Gauge Height in feet, and Discharge in second-feet, of Mississippi River at Ferguson's Falls for year ending
September 30th, 1919

Oct.	November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Discharge																					
	Feet	Sec.-ft.																					
1 101.25	405	101.81	920	101.94	1080	102.54	2060	101.92	935	101.58	585	101.00	4550	103.87	3420	104.21	5190	101.83	945	101.33	462	101.23	391
2 101.25	405	101.83	945	101.97	1110	102.44	1870	101.83	835	101.58	585	100.40	4790	103.29	3460	104.04	4870	101.78	890	101.33	462	101.23	391
3 101.25	405	101.83	945	101.97	1110	102.42	1830	101.79	790	101.58	585	103.79	4400	103.32	3520	103.88	4570	101.74	845	101.31	448	101.21	377
4 101.25	405	101.83	945	101.96	1100	102.35	1700	101.79	790	101.58	585	103.60	4040	103.33	3540	103.71	4250	101.71	810	101.31	448	101.21	377
5 101.27	419	101.83	945	101.92	920	102.60	2170	101.78	780	101.58	585	103.10	3820	103.36	3590	103.56	3970	101.68	780	101.31	448	101.21	377
6 101.36	485	101.83	945	101.92	920	102.82	2580	101.77	770	101.62	620	103.40	3670	103.40	3670	103.50	3860	101.63	730	101.31	448	101.19	364
7 101.45	555	101.83	945	101.92	920	102.11	1300	101.75	750	101.65	650	103.35	3580	103.38	3630	103.50	3860	101.57	670	101.31	448	101.17	352
8 101.52	620	101.83	945	101.94	1080	102.17	1250	101.75	750	101.62	620	103.33	3540	103.38	3630	103.50	3860	101.56	650	101.31	448	101.21	348
9 101.60	700	101.84	960	101.96	1100	102.17	1250	101.72	720	101.67	670	103.40	3670	103.35	3580	103.50	3860	101.54	640	101.31	448	101.31	448
10 101.66	760	101.88	1010	102.00	1150	102.21	1300	101.71	710	101.67	670	103.85	3930	103.44	3560	103.44	3750	101.51	610	101.31	448	101.29	433
11 101.69	790	101.85	970	101.97	1110	102.42	1650	101.69	690	101.67	670	103.71	4250	103.33	3540	103.30	3480	101.49	590	101.31	448	101.29	433
12 101.69	790	101.83	945	101.80	910	102.48	1750	101.67	670	101.66	660	103.75	4330	103.38	3630	103.27	3420	101.45	590	101.31	448	101.26	412
13 101.70	800	101.81	920	101.77	875	102.64	2060	101.67	670	101.66	660	103.79	4400	103.40	3670	103.19	3270	101.42	530	101.29	433	101.23	391
14 101.72	820	101.80	910	101.90	970	102.17	1250	101.67	670	101.63	630	103.85	4510	103.42	3710	103.04	3000	101.40	515	101.29	433	101.19	364
15 101.69	790	101.78	890	101.99	1140	102.12	1180	101.65	650	101.65	650	103.88	4570	103.42	3710	102.92	2770	101.40	530	101.29	433	101.17	352
16 101.67	770	101.75	855	102.06	1230	101.98	1010	101.62	620	101.65	650	103.90	4610	103.42	3710	102.79	2520	101.42	530	101.29	433	101.17	352
17 101.63	730	101.74	845	102.02	1230	101.92	935	101.71	710	101.67	670	103.92	4650	103.42	3710	102.69	2340	101.42	530	101.29	433	101.17	352
18 101.61	710	101.77	875	102.08	1260	101.93	945	101.70	700	101.67	670	103.91	4630	103.39	3650	102.61	2190	101.42	530	101.31	448	101.14	334
19 101.58	680	101.82	935	102.13	1330	101.92	935	101.65	650	102.11	110	103.88	4570	103.33	3540	102.50	1980	101.42	530	101.32	455	101.12	322
20 101.56	660	101.91	1640	102.13	1330	101.92	935	101.62	620	102.27	1250	103.87	4580	103.25	3380	102.44	1870	101.39	510	101.31	448	101.12	322
21 101.58	770	101.75	1110	102.17	1400	101.92	935	101.65	650	102.52	1650	103.88	4480	103.38	3630	102.35	1700	101.38	500	101.31	448	101.12	322
22 101.58	680	101.91	845	102.02	1470	101.92	935	101.65	650	102.71	2000	103.88	4480	103.58	4000	102.27	1560	101.41	525	101.31	448	101.12	322
23 101.58	680	102.04	1210	102.25	1520	101.87	875	101.61	610	102.88	2320	103.71	4250	104.04	4870	102.22	1470	101.45	555	101.31	448	101.12	322
24 101.58	680	102.04	1210	102.29	1590	101.90	910	101.58	585	103.12	2770	103.54	3630	104.25	5270	102.18	1410	101.40	550	101.31	448	101.16	346
25 101.58	680	102.03	1190	102.24	1510	101.90	910	101.58	585	103.38	3250	103.50	3860	104.79	6270	102.12	1320	101.42	530	101.31	448	101.23	391
26 101.58	680	102.00	1150	102.22	1490	101.89	900	101.58	585	103.58	3630	103.44	3750	105.19	720	102.07	1250	101.42	530	101.31	448	101.23	391
27 101.58	680	102.00	1150	102.38	2130	101.88	890	101.58	585	103.78	4420	103.56	3650	105.19	720	101.97	1110	101.42	530	101.29	433	101.17	352
28 101.58	680	101.97	1110	102.32	1830	101.88	890	101.58	585	103.96	4340	103.33	3540	105.10	6860	101.91	1040	101.40	550	101.29	433	101.14	334
29 101.63	730	101.92	1050	102.42	1830	101.88	890	101.58	585	104.04	4500	103.30	3480	104.93	6540	101.90	1030	101.40	515	101.27	419	101.13	328
30 101.75	855	101.93	1070	102.44	1870	101.88	890	101.58	585	104.05	4700	103.29	3460	104.60	5920	101.85	970	101.38	500	101.25	405	101.12	322
31 101.79	900	101.88	102.46	1900	101.88	890	101.58	585	104.05	4650	103.92	4650	104.40	5540	101.36	485	101.25	405	101.25	405	101.25	405	

Monthly Discharge for Mississippi River at Ferguson's Falls for year ending September 30th, 1919

Drainage Area, 1,042 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	900	405	665	.87	.39	.64	.74
November "	1,210	845	1,003	1.16	.81	.96	1.07
December "	2,130	875	1,330	2.05	.84	1.28	1.48
January... (1919)	2,580	890	1,286	2.48	.85	1.23	1.42
February.....	935	585	689	.90	.56	.66	.69
March.....	4,700	585	1,666	4.51	.56	1.59	1.83
April.....	4,790	3,460	4,129	4.60	3.31	3.96	4.42
May.....	7,020	3,380	4,348	6.74	3.24	4.17	4.81
June	5,190	970	2,725	4.98	.93	2.62	2.92
July	945	485	602	.91	.47	.58	.67
August	462	405	442	.44	.39	.42	.48
September.....	448	322	363	.43	.31	.35	.39
The year	7,020	322	1,607	6.74	.31	1.54	20.90

Mississippi River at Galetta

Location—In the Village of Galetta, Township of Fitzroy, County of Carleton, about one hundred feet above, and parallel to the highway bridge over the river. It is only a few hundred yards below the dam and power house of the Galetta Power & Milling Company.

Records Available—Discharge measurements from June, 1915, and gauge readings twice daily from June 24, 1915.

Drainage Area—1,456 square miles.

Gauge—Gauge readings are secured by measuring to water surface with graduated staff, from B.M.—elev. 255.55—on bridge 5 feet north of left abutment.

Channel and Control—Channel is straight for 200 feet above and below the section to a little rapid. The river bed is composed of gravel and stones, with solid rock on the right bank and gravel on the left bank. The point of control is through a solid rock formation a hundred and fifty yards below the section.

Discharge Measurements—Made by wading and from a boat held up to tag line by cable. Extreme high-water measurements have to be made from the highway bridge.

Winter Flow—The winter conditions do not seriously affect the gauge height and discharge relations.

Regulation—The river is subject to regulation throughout its entire length. In the upper river are storage dams for power purposes, as well as timber dams for driving purposes.

Accuracy—Piers of old bridge which have not been removed will likely change curve.

Co-operation—Discharge measurements made at the bridge by the Department of Public Works of Canada.

Observer—F. Monteforte, Galetta.

Discharge Measurements of Mississippi River at Galetta for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 23.....	Hatton, M	120	390	3.71	246.88	1,446
Dec. 30.....	"	110	450	4.10	247.59	1,846 (a)
1919						
Jan. 25.....	"	105	241	3.26	245.63	786 (a)
Mar. 3.....	Ronald, F	87	158	3.14	244.88	500 (a)
" 3.....	"	87	149	3.33	244.80	496 (a).
" 31.....	"	112	1,021	5.31	250.55	5,426
" 31.....	"	192	1,194	3.67	250.55	4,381 (b)
April 19.....	Hatton M	112	1,088	5.38	251.05	5,855
" 19.....	"	192	1,316	3.84	251.05	5,164 (b)
May 31.....	Ronald, F	114	1,157	5.98	251.78	6,919
" 31.....	"	192	1,360	4.66	251.78	6,331 (b)
June 24.....	"	111	351	434	247.32	1,524
July 22.....	Hatton, M	95	176	374	244.65	659
Sept. 10.....	Ronald, F	95	184	370	244.77	681

(a) Ice measurement.

(b) Taken on highway bridge $\frac{1}{4}$ mile above regular section.

Daily Gauge Height in feet, and Discharge in second-feet, of Mississippi River at Galetta for year ending
September 30th, 1919

No. A	October		November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Dis- charge																							
	Feet	Sec.-ft.																							
1	244.43	489	246.72	1270	246.28	1090	247.55	1460	245.80	780	245.26	620	250.30	3820	249.88	3320	251.59	6130	245.84	925	244.30	450	243.63	249	243.76
2	244.76	590	246.51	1180	246.34	1120	247.67	1330	245.67	740	245.05	555	250.55	4170	250.30	3820	251.34	5550	245.68	880	244.30	450	243.76	288	243.67
3	244.72	575	246.26	1080	246.61	1220	247.34	1360	246.22	925	244.88	505	250.55	4170	250.15	3620	251.09	5040	245.68	880	244.13	399	243.67	261	243.67
4	244.55	525	245.93	965	246.61	1220	247.34	1360	245.97	840	245.30	630	250.59	4230	249.93	3380	250.80	4560	245.59	845	244.13	399	244.09	387	243.67
5	244.72	575	246.72	1270	246.45	1160	247.07	1250	246.05	865	245.55	705	250.51	4110	250.01	3470	250.59	4230	245.38	775	243.88	324	244.13	399	243.67
6	247.10	1440	246.47	1170	246.36	1120	247.51	1440	245.93	825	245.47	680	250.59	4230	250.01	3470	250.43	4000	245.09	685	243.72	276	244.26	438	243.67
7	245.89	950	246.59	1220	246.43	1150	247.32	1350	245.84	795	245.67	740	250.68	4370	249.97	3420	250.22	3720	244.93	640	244.30	450	244.22	426	243.84
8	245.89	950	246.55	1200	246.15	1040	247.17	1250	245.75	765	245.55	705	250.76	4500	249.93	3380	250.01	3470	244.76	590	244.22	426	243.84	312	243.67
9	245.68	880	246.63	1230	246.93	1000	247.07	1250	245.64	730	245.30	630	250.76	4500	249.93	3380	249.88	3320	245.13	700	244.22	426	244.26	438	243.67
10	245.68	880	246.30	1100	246.11	1030	246.45	1010	245.64	730	245.47	680	250.80	4560	249.76	3200	249.76	3200	245.01	665	244.22	426	244.80	600	243.67
11	245.72	890	246.13	995	245.47	805	247.20	1300	245.47	710	245.63	730	251.05	4970	250.05	3520	249.67	3110	244.97	650	243.84	312	244.47	500	243.67
12	245.68	880	246.13	1040	246.65	1240	247.55	1460	245.64	730	245.72	755	251.17	5190	249.55	2900	244.76	590	243.98	354	244.38	474	243.67		
13	245.54	830	246.59	1220	246.17	1050	247.13	1270	245.51	695	245.67	740	251.01	4900	250.01	3470	249.43	2870	244.72	575	244.13	399	244.30	450	243.67
14	245.59	845	246.51	1180	246.47	1170	247.07	1250	245.55	705	245.80	780	250.93	4770	249.93	3380	249.30	2760	244.38	474	244.17	411	244.22	426	243.67
15	245.93	965	246.38	1130	247.22	1490	246.84	1160	245.55	705	245.63	730	250.80	4560	249.88	3320	249.13	2620	244.63	550	244.22	426	244.01	363	243.67
16	246.18	1050	246.22	1070	247.22	1490	246.71	1100	245.13	580	245.43	670	250.97	4830	249.80	3240	248.93	2460	245.01	665	244.26	438	244.05	375	243.67
17	246.22	1070	245.97	980	247.24	1500	246.76	1200	245.01	545	245.38	655	250.93	4770	250.05	3520	248.80	3270	244.80	600	243.84	312	244.09	387	243.67
18	246.18	1050	246.39	1140	247.22	1490	246.55	1040	245.22	605	247.51	1620	251.55	6030	249.76	3250	244.76	590	243.72	276	244.22	426	243.67		
19	246.26	1080	247.10	1440	247.09	1430	246.43	1000	245.34	640	249.30	2760	251.30	5460	249.84	3280	248.43	2120	244.51	515	243.93	339	244.22	426	243.67
20	246.18	1050	247.47	1600	247.11	1440	246.26	920	245.39	655	249.55	2930	251.09	5040	249.76	3200	248.13	1940	244.30	450	244.22	426	244.26	438	243.67
21	246.13	1040	247.13	1450	247.09	1430	246.43	1000	245.22	605	249.93	3380	250.88	4690	249.80	3240	248.74	1780	244.30	450	244.26	438	243.97	351	243.67
22	246.22	1070	247.13	1450	247.20	1440	246.24	935	245.09	665	249.68	3120	250.76	4500	250.76	4500	247.59	1660	244.51	515	244.34	462	244.34	300	243.67
23	246.22	1070	247.13	1450	248.45	2070	246.24	935	245.01	545	249.84	3280	250.55	4170	252.05	7330	247.38	1560	244.68	565	244.22	426	244.22	312	243.67
24	245.76	905	246.84	1220	247.99	1160	245.39	985	244.97	530	250.26	2670	250.47	4060	245.76	6580	247.22	1490	244.51	515	244.05	375	244.18	414	243.67
25	245.51	820	246.94	1320	247.61	1570	245.72	755	245.39	625	245.63	4290	250.39	39350	251.58	6110	244.47	500	243.97	426	244.22	426	243.67		
26	245.47	805	246.76	1280	246.78	1660	246.43	1000	245.34	640	250.97	4830	250.26	36770	251.88	6890	246.05	1010	244.50	510	244.01	363	244.38	474	243.67
27	245.26	740	246.72	1270	247.86	1600	246.28	950	245.30	5460	250.26	3770	251.88	6890	245.88	950	244.43	489	244.17	411	244.26	438	243.67		
28	245.17	710	246.73	1270	247.72	1530	246.43	1000	245.22	605	250.34	3880	250.26	36770	251.97	7120	245.67	875	244.26	438	244.26	387	243.67		
29	246.59	1220	246.97	1380	247.63	1490	246.34	970	245.39	520	250.22	3720	252.01	7230	245.76	905	244.17	411	244.17	411	244.34	312	243.67		
30	246.33	1120	247.01	1390	247.61	1480	246.30	965	245.30	515	250.59	4230	250.09	3570	251.93	7020	245.72	890	244.26	438	244.26	376	243.67		
31	246.80	1300	247.63	1247.01	247.63	1490	246.30	965	245.30	520.55	4170	245.76	6580	250.09	3570	251.76	6580	244.34	462	244.01	363	244.34	312	243.67	

Monthly Discharge of Mississippi River at Galetta for the year ending
September 30th, 1919

Drainage Area, 1,456 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	1,440	489	915	.99	.34	.63	.73
November "	1,600	965	1,235	1.10	.66	.85	.95
December "	2,070	805	1,348	1.42	.55	.93	1.07
January (1919)	1,460	755	1,134	1.00	.52	.78	.90
February	925	530	690	.64	.36	.47	.49
March.....	5,460	505	2,023	3.75	.35	1.39	1.60
April.....	6,030	3,570	4,438	4.14	2.45	3.05	3.40
May.....	7,330	3,200	4,481	5.03	2.20	3.08	3.55
June.....	6,130	875	2,696	4.21	.60	1.85	2.06
July.....	935	411	598	.64	.28	.41	.47
August	462	276	392	.32	.19	.27	.31
September.....	600	249	392	.41	.17	.27	.30
The year	7,330	249	1,698	5.03	.17	1.17	15.88

Mississippi River near Snow Road

Location—At the highway bridge about two miles below the Village of Snow Road, Township of Sherbrooke, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings on week days since July 30, 1915.

Drainage Area—446 square miles.

Gauge—0 to 6 ft. of standard gauge plates secured vertically to the downstream side of the right abutment of the highway bridge. The elevation of the zero on gauge is assumed as 100.00.

Channel and Control—The channel approaches and leaves the section at a slight angle. The banks are high, and are not liable to overflow. The bridge pier forms two channels at the gauging section. Earth, rocks and gravel in the river bed, not shifting. Control for ordinary stages not well defined. At very high water stages the point of control is probably the head of the rapids just above High Falls.

Discharge Measurements—Measurements made from bridge at all stages.

Winter Flow—Discharge relation affected by ice.

Regulation—The power and lumber companies operating on this river have storage dams above this point.

Accuracy—No Sunday readings have been secured by gauge-readers, but the fluctuation in stage is slow. The open-water relation should be good.

Observer—W. J. Jackson, Snow Road.

Discharge Measurements of Mississippi River near Snow Road for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 26.....	Ronald, F.....	58	343	1.06	102.46	365(a)
1919						
Jan. 16.....	"	59	373	1.54	103.02	575(a)
Jan. 16.....	"	59	373	1.34	103.02	507(a)(b)
Mar. 5.....	"	58	348	.88	102.58	305(a)
Apr. 2.....	"	58	476	3.66	104.75	1,746
" 30.....	"	68	459	3.38	104.50	1,549
May 30.....	"	68	545	4.43	106.04	2,412
Aug. 7.....	Hatton, M.....	58	327	1.14	102.35	374
Sept. 7.....	Ronald, F	58	313	.85	102.17	265
" 7.....	"	58	313	.78	102.17	244

(a) Ice measurement.

(b) .2 and .8 method used for part of this measurement, but .6 as used in preceding measurement considered better.

Daily Gauge Height in feet, and Discharge in second-feet, of Mississippi River near Snow Road for year ending September 30th, 1919

Mo.	October		November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht.	Discharge																								
	Feet	Sec.-ft.																								
1	102.04	234	102.33	322	102.58	380	103.31	690	102.81	382	102.52	378	102.79	303	104.74	1340	104.50	1540	105.58	2840	102.67	443	102.50	378	102.29	309
2	102.00	224	102.33	322	102.60	408	103.31	690	102.79	368	102.52	319	104.58	1610	104.75	1760	105.50	2590	102.58	408	102.50	378	102.27	303		
3	102.00	224	102.33	322	102.62	416	103.29	680	102.77	368	102.50	312	103.83	1050	104.42	1840	106.42	2410	102.46	365	102.35	328	102.25	296		
4	102.02	229	102.33	322	102.62	424	103.31	690	102.67	335	102.50	312	104.25	1340	104.92	1920	105.17	2150	102.42	352	102.35	328	102.25	296		
5	102.04	234	102.31	315	102.62	424	103.31	690	102.65	328	102.50	319	104.58	1610	104.58	1760	105.50	2590	102.58	408	102.50	378	102.25	296		
6	102.29	399	102.67	424	103.31	690	102.65	328	102.50	345	104.42	1480	104.79	1800	104.82	1830	102.50	378	102.33	328	102.25	296				
7	102.33	322	102.27	393	102.67	443	103.21	640	102.58	306	102.52	352	104.42	1480	104.71	1730	104.46	1840	102.46	365	102.33	322	102.25	296		
8	102.33	322	102.27	393	102.67	443	103.21	640	102.58	300	102.52	355	104.50	1540	104.58	1610	104.83	1840	102.42	352	102.33	322	102.25	296		
9	102.35	328	102.27	393	102.67	443	103.21	640	102.54	293	102.54	355	104.67	1690	104.50	1540	104.67	1690	102.50	378	102.33	322	102.25	296		
10	102.38	338	102.27	393	102.67	443	103.17	620	102.54	293	102.54	358	104.67	1690	104.50	1540	104.67	1690	102.50	378	102.33	322	102.21	284		
11	102.38	338	102.25	338	102.67	443	103.17	620	102.54	293	102.54	358	104.92	1920	104.50	1540	104.92	1920	102.50	378	102.33	322	102.21	284		
12	102.25	296	102.25	396	102.69	451	103.31	690	102.62	319	102.50	345	104.42	1480	104.79	1800	104.82	1830	102.50	378	102.33	322	102.21	284		
13	102.29	302	102.31	335	102.71	459	103.10	540	102.62	319	102.54	393	105.00	2020	104.75	1760	104.25	1340	102.46	365	102.33	322	102.21	284		
14	102.29	302	102.29	309	102.73	468	103.21	540	102.65	328	102.50	386	105.00	1990	104.75	1760	104.08	1230	102.46	365	102.33	322	102.21	284		
15	102.25	296	102.25	323	102.73	468	103.08	540	102.65	328	102.50	378	105.00	1990	104.58	1610	104.00	1200	102.50	378	102.33	322	102.21	284		
16	102.27	303	102.21	284	102.73	468	103.00	540	102.54	324	102.54	393	104.92	1920	104.46	1510	104.00	1170	102.50	378	102.33	322	102.17	272		
17	102.29	309	102.25	309	102.73	468	103.10	585	103.00	497	102.62	319	102.58	408	104.87	1870	104.42	1480	104.08	1230	102.50	378	102.33	322	102.17	272
18	102.29	309	102.25	309	102.73	468	103.17	620	103.00	497	102.62	319	102.75	476	105.08	2060	104.75	1760	104.25	1340	102.46	365	102.33	322	102.17	272
19	102.25	296	102.27	303	102.73	468	103.17	630	103.00	497	102.58	306	102.92	550	105.17	2150	104.42	1480	104.00	1170	102.50	378	102.35	328	102.12	256
20	102.31	306	102.33	322	103.19	630	103.19	630	102.65	293	102.54	293	103.33	750	104.00	2040	104.33	1400	103.71	975	102.33	322	102.00	224		
21	102.31	315	102.42	352	103.19	630	102.65	480	102.54	293	104.00	1170	104.92	1920	104.50	1540	103.53	870	102.50	378	102.33	322	102.00	224		
22	102.29	309	102.58	408	103.33	670	102.96	480	102.54	293	103.67	950	104.83	1840	105.17	2150	104.00	1170	102.50	378	102.33	322	102.00	224		
23	102.29	309	102.56	401	103.35	670	102.92	463	102.54	300	104.58	1140	104.75	1760	106.08	3180	103.12	645	102.46	365	102.33	322	102.00	224		
24	102.31	315	102.56	397	103.35	710	102.90	455	102.58	306	104.21	1320	104.67	1690	106.17	3280	103.00	585	102.46	365	102.33	322	101.96	214		
25	102.29	309	102.54	393	103.35	710	102.88	447	102.54	293	104.33	1400	104.67	1690	106.00	3320	102.92	550	102.50	378	102.33	322	101.96	214		
26	102.29	309	102.54	395	103.33	700	102.92	424	102.54	281	105.33	2310	104.62	1650	106.00	3400	102.83	510	102.50	378	102.33	322	101.94	208		
27	102.29	309	102.44	358	103.33	700	102.92	424	102.54	281	105.33	2310	104.62	1650	106.00	3400	102.83	510	102.50	378	102.33	322	101.94	208		
28	102.12	256	102.46	365	103.33	700	102.88	408	102.50	281	105.33	2310	104.62	1650	106.00	3450	102.75	476	102.50	378	102.33	322	101.94	208		
29	102.08	245	102.44	358	103.33	700	102.85	397	102.50	281	105.33	2310	104.62	1650	106.00	3450	102.75	476	102.50	378	102.33	322	101.94	208		
30	102.25	296	102.42	352	103.33	700	102.83	389	102.50	281	105.33	2310	104.62	1650	106.00	3450	102.75	476	102.50	378	102.33	322	101.94	208		
31	102.33	322	103.33	700	102.83	389	102.50	281	105.33	2310	104.62	1650	106.00	3450	102.75	476	102.50	378	102.33	322	101.94	208				

Note—May 25th to 30th—Water above gauge—estimated high water, 106.33.

Monthly Discharge of Mississippi River near Snow Road for year
ending September 30th, 1919

Drainage Area, 446 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ..(1918)	338	224	293	.76	.50	.66	.76
November "	408	284	329	.91	.64	.74	.83
December "	710	380	555	1.59	.85	1.24	1.43
January ..(1919)	690	389	539	1.55	.87	1.21	1.40
February	382	281	316	.86	.63	.71	.74
March	2,590	287	848	5.81	.64	1.90	2.19
April	2,150	1,050	1,723	4.82	2.35	3.87	4.32
May	3,490	1,400	2,141	7.83	3.14	4.80	5.53
June	2,840	459	1,329	6.37	1.03	2.98	3.32
July	443	352	375	.99	.79	.84	.97
August	378	315	327	.85	.70	.73	.84
September	309	208	258	.69	.47	.58	.65
The year	3,490	208	754	7.83	.47	1.69	22.94

Moira River near Foxboro

Location—Three hundred feet above G.T.R. Crossing, and six hundred feet east of Foxboro Station, on the G.T.R.-Belleville, Peterboro Branch. Near lot 5, concession VI, Township of Thurlow, County of Hastings.

Records Available—Monthly discharge measurements from September, 1915, and gauge readings from October 12, 1915.

Drainage Area—1,038 square miles.

Gauge—A boxed chain gauge on the right bank of the river against a tree 400' feet above section. When the gauge reads zero the elevation of the water is 320.46.

Channel and Control—At one side of the river at the section are boulders and rocks, but the rest of the section is smooth, solid rock, liable to no movement at all. The control is only a few feet below the section and is not likely to freeze over in winter except for short periods of time.

Discharge Measurements—At ordinary stages the measurements are made by wading, at tag line. At high water measurements are made by boat at a point opposite the gauge, or at second bridge below section.

Winter Flow—The relation of gauge height to discharge is but slightly affected by ice, and in a fairly uniform manner throughout the winter.

Regulation—The river above the section has dams in many places besides the regulation for the lumber interest, on different tributary lakes and streams.

Accuracy—Open water relation will be good.

Observer—C. Stewart, Foxboro P.O.

Discharge Measurements of Moira River near Foxboro for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 7.....	Hatton, M.....	156	310	2.14	322.79	662 (a)
" 13.....	Ronald, F.....	155	279	1.74	322.63	484 (a)
Mar. 12.....	"	171	373	2.53	323.08	943 (a)
" 25.....	"	287	2,022	5.03	326.58	6,122 (b)
April 17.....	"	287	1,484	2.10	324.85	3,122 (b)
May 16.....	"	287	1,435	2.60	324.94	3,731
July 3.....	"	162	273	1.58	322.36	431
Aug. 15.....	Hatton, M.....	160	149	.60	321.67	88
Sept. 14.....	Ronald, F.....	144	107	.36	321.36	38

(a) Ice measurement.

(b) Taken 2 miles below gauge.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet, and Discharge in second-feet, of Moira River near Foxboro for year ending September 30th, 1919

Sec'd #	October		November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht.	Dis- charge																								
	Feet	Sec'-ft.																								
1	322.08	262	323.08	945	323.52	1410	324.49	2580	323.02	800	322.38	364	325.66	4180	324.28	2330	325.17	2380	322.57	540	321.75	145	321.58	106		
2	322.08	262	323.08	945	323.46	1340	324.46	2540	323.00	780	322.54	454	325.54	4000	324.30	2350	324.90	3110	322.53	510	321.73	139	321.58	106		
3	322.10	270	323.08	945	323.38	1250	324.33	3290	322.98	765	322.68	545	325.34	3720	324.39	2460	324.73	2890	322.45	460	321.72	136	321.56	102		
4	322.10	270	323.21	1070	323.36	1230	324.32	3220	96	750	322.73	580	325.20	3530	324.56	2670	324.50	2590	322.41	436	321.71	133	321.53	96		
5	322.27	278	.....	1190	323.25	1110	324.21	2240	323.00	780	322.79	625	325.00	3240	324.84	3130	324.25	2520	322.39	424	321.68	126	321.54	98	
6	322.36	408	.....	1210	323.25	1110	323.63	1550	323.00	780	322.09	860	324.90	3110	325.01	3250	324.16	2180	322.45	460	321.66	122	321.52	98	
7	322.36	408	.....	1330	323.25	1110	323.63	1550	322.92	715	323.04	815	324.87	3070	325.06	3320	324.00	1990	322.38	419	321.66	122	321.52	94	
8	322.36	408	.....	1450	323.23	1090	323.62	1530	322.76	600	323.04	815	324.84	3030	325.05	3310	323.86	1820	322.31	380	321.64	118	321.52	94	
9	322.36	408	.....	1570	323.17	1030	323.54	1440	322.72	575	322.98	765	324.85	3040	324.96	3190	323.73	1670	322.30	375	321.63	116	321.48	87	
10	322.36	408	.....	1690	323.75	1690	323.17	1030	323.53	1430	322.58	478	323.97	755	324.85	3040	324.79	2790	323.69	397	321.63	116	321.46	84	
11	322.36	408	1640	323.71	1640	323.17	1030	323.52	1410	322.57	472	323.04	815	325.03	3280	324.90	3110	323.66	1580	322.29	370	321.65	120	321.44	81
12	322.54	520	323.67	1590	323.67	1590	323.67	1550	322.56	466	323.06	835	325.16	3460	325.02	3270	323.61	1520	322.22	331	321.63	116	321.44	81		
13	322.58	520	323.62	1530	323.46	1340	323.36	1230	323.53	448	323.11	880	325.25	3590	325.04	3300	323.56	1460	322.22	331	321.63	116	321.42	78		
14	322.63	580	323.55	1450	323.26	1570	323.23	1090	322.58	478	323.08	850	325.12	3410	325.12	3410	323.48	1370	322.09	266	321.63	116	321.41	76		
15	322.63	580	323.51	1400	323.93	1910	323.21	975	322.59	549	323.29	835	325.24	3580	325.06	3320	323.36	1230	322.08	262	321.65	120	321.39	74		
16	322.63	580	323.47	1350	323.98	1970	323.21	975	322.48	419	323.29	1150	325.28	3630	324.88	3080	323.24	1100	322.02	238	321.72	136	321.34	69		
17	322.63	580	323.44	1320	324.00	1990	323.21	975	322.47	414	323.24	2270	325.43	3840	324.82	3010	323.17	1630	322.00	230	321.72	136	321.33	68		
18	322.63	630	580	323.41	1280	324.00	1990	323.21	975	322.46	408	323.25	2365	325.53	3980	324.72	2890	323.08	945	321.98	223	321.63	116	321.27	62	
19	322.58	545	580	323.46	1340	324.05	2050	323.21	975	322.54	454	323.36	3740	325.56	4030	324.69	2840	323.00	870	321.97	220	321.81	164	321.25	60	
20	322.77	680	580	323.56	1460	324.06	2050	323.17	935	322.46	408	323.25	4440	325.60	4090	324.66	2800	322.99	860	321.93	216	321.80	160	321.21	56	
21	322.87	755	523.46	1340	324.06	2060	323.17	935	322.29	315	323.13	4930	325.59	4080	324.86	3060	322.90	780	321.96	216	321.73	139	321.36	71		
22	322.87	755	523.44	1320	324.23	2270	323.15	915	322.19	266	323.18	5370	325.59	4080	325.15	3450	322.81	710	321.93	216	321.72	136	321.39	74		
23	322.87	755	523.44	1320	324.23	2270	323.15	900	322.15	250	323.15	5650	325.61	4100	325.31	3670	322.74	660	321.91	198	321.71	133	321.44	81		
24	322.67	610	523.50	1380	324.27	2310	323.04	815	322.29	315	323.06	5840	325.65	4160	325.88	4520	322.70	630	321.93	206	321.74	142	321.46	84		
25	322.69	625	523.55	1450	324.40	2470	323.04	815	322.38	364	323.57	5720	325.67	4260	326.30	5230	322.65	595	321.93	206	321.76	148	321.35	70		
26	322.74	74	660	323.50	1390	324.44	2520	323.06	835	322.38	364	323.56	5650	325.64	4150	326.26	68	615	321.95	212	321.75	145	321.25	63		
27	322.75	666	523.47	1350	324.40	2470	323.06	835	322.29	315	323.49	5570	325.58	2690	326.64	5860	322.68	615	321.92	202	321.74	139	321.25	60		
28	322.79	695	523.46	1340	324.44	2520	323.05	825	322.38	364	323.56	5700	324.64	2770	326.40	5410	322.68	615	321.92	202	321.74	139	321.24	59		
29	322.88	765	523.56	1460	324.49	2580	323.04	815	322.44	326	323.46	5160	324.44	2520	326.10	4880	322.66	600	321.92	202	321.61	112	321.21	56		
30	323.00	870	523.56	1460	324.51	2600	323.04	815	322.44	326	323.46	5030	324.30	2350	325.77	4350	322.61	565	321.88	188	321.56	102	321.38	73		
31	323.08	945	.....	324.50	324.50	324.50	324.50	324.50	815	322.04	326.01	4730	322.55	4010	322.55	325.55	4010	321.76	148	321.56	102	321.38	73		

Monthly Discharge of Moira River near Foxboro for year ending
September 30th, 1919

Drainage Area, 1,038 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918) ..	945	262	551	.91	.25	.53	.61
Nov. " ..	1,690	945	1,351	1.63	.91	1.30	1.45
Dec. " ..	2,600	1,030	1,782	2.50	.99	1.72	1.98
Jan. (1919) ..	2,580	815	1,281	2.49	.79	1.23	1.42
Feb. " ..	800	250	501	.77	.24	.48	.50
March " ..	5,840	364	2,755	5.63	.35	2.65	3.06
April " ..	4,200	2,350	3,540	4.05	2.26	3.41	3.80
May " ..	5,930	2,330	3,557	5.71	2.24	3.42	3.94
June " ..	3,480	565	1,400	3.35	.54	1.35	1.51
July " ..	540	148	299	.52	.14	.29	.33
Aug. " ..	164	102	129	.16	.10	.12	.14
Sept. " ..	106	56	79	.10	.05	.08	.09
The year.....	5,930	56	1,441	5.71	.05	1.39	18.84

Muskoka River (South Branch) at Black's Bridge

Location—At the highway bridge known as Black's Bridge, about five and one-half miles east of the Town of Bracebridge and two and one-half miles east of the Hydro-Electric Power Commission's plant at South Falls.

Records Available—High water measurements have been taken here since April 24th, 1915, in conjunction with the Tretheway's Falls section which has been discontinued, gauge heights from June 4th, 1918.

Drainage Area—668 square miles.

Gauge—Twelve feet of standard gauge plates secured vertically to the downstream corner of right abutment. Zero of gauge (elevation 85.69) is referred to a bench mark (elevation 99.65) painted on downstream corner of right abutment, and also to a bench mark (elevation 100.17) which is the head of a nail driven horizontally in a telephone pole one hundred feet downstream from right abutment. Head of nail is about five feet above ground and is plainly marked by painted arrow.

Channel and Control—The channel is straight for about 150 feet above and 100 feet below section. Both banks are liable to overflow. Point of control is not clearly defined. Bed of stream is composed of sand. As the velocity is not high at any stage this is not liable to shift. At low stages there are three channels and at high stages five, these being formed by the bridge piers.

Discharge Measurements—Made from the bridge at high and ordinary stages with small Price meter. At low stages measurements are made at the Matthiasville bridge, two miles above.

Winter Flow—Owing to the somewhat sluggish flow, ice will likely form to a great thickness. During the winter months, measurements will be made at the low water section.

Regulation—The Provincial Department of Public Works operate the dam at Baysville controlling the run off from most of the drainage area.

Accuracy—A fairly well defined curve has been established here.

Observer—Wesley Morrow, Muskoka Falls P.O.

Discharge Measurements at Muskoka River (South Branch) at Black's Bridge for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 10.....	Ronald, F	89	1,352	.40	90.86	547
Dec. 17.....	"	97	1,449	.67	91.77	967
1919						
Feb. 2.....	"	89	1,459	.62	91.94	1,001 (a)
" 18.....	"	45	258	3.90	91.02	1,007 (a)
Mar. 19.....	"	96	1,491	.75	92.27	1,125(a)(b)
April 12.....	"	104	1,691	1.34	94.25	2,260
May 20.....	"	104	1,539	1.04	92.77	1,603
July 9.....	"	94	1,499	.74	92.06	1,112
Aug. 20.....	Hatton, M	39	151	1.93	89.94	291
" 20.....	"	41	139	2.27	89.94	316
Sept. 24.....	Ronald, F	39	118	2.00	89.86	237

(a) Ice measurement.

(b) Log boom above section.

Daily Gauge Height in feet, and Discharge in second-feet, of Muskoka River (South Branch) at Black's Bridge for
year ending September 30th, 1919

Sec- No.	October		November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet	Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet				
		Gauge Ht., Feet	Dis- charge, Sec.-ft., Feet																							
1	90.11	369	92.36	1200	92.11	1100	92.27	1170	92.02	1070	90.94	655	93.19	1600	94.19	2200	95.19	3020	93.69	1880	89.86	290	89.94	315		
2	90.11	369	92.36	1200	92.11	1100	92.27	1170	91.98	1050	90.94	655	93.19	1600	93.77	1930	94.19	2200	92.27	1170	90.11	369	89.94	315		
3	90.11	369	92.36	1200	92.11	1100	92.27	1170	91.90	1020	90.94	655	93.19	1600	93.77	1930	94.86	2720	92.27	1170	90.11	369	89.86	290		
4	90.11	369	92.44	1240	92.11	1100	92.36	1200	91.86	1000	90.94	655	93.36	1690	93.77	1930	93.36	1690	93.19	1600	92.27	1170	90.11	369	89.86	290
5	90.36	451	92.44	1240	92.11	1100	92.36	1200	91.86	1000	90.94	655	93.36	1690	93.69	1880	93.19	1600	92.27	1170	90.02	340	89.86	290		
6	90.94	655	92.44	1240	92.19	1140	92.36	1200	91.86	1000	90.94	655	93.36	1690	93.69	1880	93.19	1600	92.27	1170	89.94	315	89.86	290		
7	90.94	655	92.44	1240	92.11	1100	92.40	1220	91.86	1000	90.94	655	93.52	1780	93.69	1880	93.19	1600	92.27	1170	89.86	290	89.86	290		
8	91.02	680	92.44	1240	92.11	1100	92.44	1240	91.77	970	90.94	655	93.61	1840	93.69	1880	93.19	1600	92.11	1100	89.69	239	89.69	239		
9	91.19	740	92.44	1240	92.11	1100	92.52	1270	91.77	970	90.94	655	93.69	1880	93.77	1930	93.19	1600	91.94	1040	89.61	215	89.27	116		
10	91.19	740	92.52	1270	92.36	1200	92.52	1270	91.69	935	90.94	655	93.86	1990	93.77	1930	93.27	1640	91.77	970	89.69	239	89.69	239		
11	91.36	805	92.44	1240	92.52	1270	92.69	1360	91.69	935	90.94	655	94.02	2080	93.71	1900	93.11	1560	91.52	870	89.61	215	89.90	302		
12	91.69	935	92.44	1240	92.69	1360	92.19	1140	91.69	935	90.94	655	94.19	2200	93.52	1780	92.86	1440	91.19	740	89.61	215	89.86	290		
13	91.69	935	92.94	1480	91.69	935	92.19	1140	91.44	835	90.94	655	94.19	2200	93.36	1690	92.69	1360	90.94	655	89.52	188	89.86	290		
14	91.77	970	93.44	1730	92.02	1070	92.52	1270	91.36	805	90.94	655	94.19	2200	93.19	1600	92.52	1270	91.02	680	89.69	239	89.77	263		
15	91.77	970	93.61	1840	91.94	1040	92.19	1140	91.02	680	90.94	655	94.44	2380	93.02	1520	92.44	1240	91.27	770	89.77	263	89.86	290		
16	91.86	1000	93.69	1880	92.02	1070	92.19	1140	91.02	680	90.94	655	94.69	2580	92.86	1440	92.27	1170	91.36	805	89.86	290	89.86	290		
17	91.86	1000	93.36	1690	91.77	970	92.19	1140	91.02	680	91.19	740	92.77	2800	92.77	1440	92.19	91.27	770	90.11	369	89.77	263			
18	91.94	1040	93.19	1600	91.73	950	92.19	1140	91.02	680	92.03	1070	94.94	2800	92.69	1360	92.19	1140	91.26	765	90.11	369	89.77	263		
19	91.94	1040	92.69	1360	91.69	935	92.15	1120	91.02	680	92.27	1170	95.19	3020	92.69	1360	92.27	1170	91.36	805	90.27	420	89.77	263		
20	92.02	1100	92.36	1200	91.86	1000	92.19	1140	91.02	680	92.52	1270	95.19	3120	92.86	1440	92.44	1240	91.69	935	90.27	420	89.77	263		
21	92.11	1100	92.36	1200	92.02	1070	92.19	1140	90.94	655	92.61	1310	95.44	3250	92.86	1440	92.44	1240	91.69	935	90.11	369	89.77	263		
22	92.11	1100	92.27	1170	92.11	1100	92.19	1140	90.94	655	92.61	1310	95.44	3250	93.02	1520	92.51	1260	90.02	340	90.02	340	89.86	290		
23	92.19	1140	92.19	1170	92.19	1140	92.19	1140	90.94	655	92.61	1310	95.44	3250	93.19	1600	92.69	1360	89.69	239	90.02	340	89.77	263		
24	92.27	1170	92.19	1170	92.19	1140	92.19	1140	90.94	655	92.69	1360	95.36	3170	93.69	1880	92.44	1240	89.86	290	90.02	340	89.86	290		
25	92.27	1170	92.19	1170	92.19	1140	92.27	1170	90.94	655	93.02	1520	95.36	3170	94.27	2260	92.27	1170	89.94	315	90.02	340	89.86	290		
26	92.27	1170	92.27	1170	92.19	1140	92.27	1170	90.94	655	93.19	1600	95.44	3250	94.86	2720	92.27	1170	90.02	340	89.86	290	89.86	290		
27	92.27	1170	92.11	1100	92.27	1170	92.19	1140	90.94	655	93.36	1690	95.19	3020	95.27	3090	92.69	1360	90.11	369	89.94	315	89.86	290		
28	92.27	1170	92.19	1140	92.19	1140	92.27	1170	92.19	655	93.44	1730	95.11	2950	95.36	3170	93.61	1840	90.11	369	89.94	315	89.86	275		
29	92.27	1170	92.27	1170	92.27	1170	92.27	1170	92.11	655	93.52	1780	94.86	2720	95.36	3170	93.52	1780	90.02	340	89.94	315	89.86	290		
30	92.36	1200	92.11	1100	92.36	1200	92.11	1100	92.06	1080	93.36	1690	95.23	3060	95.23	1780	90.69	239	89.86	290	89.86	290	89.86	290		
31	92.36	1200	92.27	1170	92.27	1170	92.27	1170	92.06	1080	93.36	1690	95.23	3060	95.23	1780	90.69	239	89.86	290	89.86	290	89.86	290		

Monthly Discharge of Muskoka River (South Branch) at Black's Bridge,
for year ending September 30th, 1919

Drainage Area, 668 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,200	369	901	1.80	.55	1.35	1.56
November "	1,880	1,100	1,301	2.81	1.65	1.95	2.18
December "	1,360	935	1,104	2.04	1.40	1.65	1.90
January (1919)	1,440	1,080	1,179	2.16	1.62	1.76	2.03
February	1,070	655	816	1.60	.98	1.22	1.27
March	1,780	655	1,026	2.66	.98	1.54	1.78
April	3,250	1,600	2,440	4.87	2.40	3.65	4.07
May	3,170	1,360	1,995	4.75	2.04	2.99	3.45
June	3,020	1,140	1,540	4.52	1.71	2.31	2.58
July	1,880	239	770	2.81	.36	1.15	1.33
August	420	188	310	.63	.28	.46	.53
September	315	116	276	.47	.17	.41	.46
The year	3,250	116	1,138	4.87	.17	1.70	23.11

Muskoka River (North Branch) near Port Sydney

Location—At the highway bridge near the Village of Port Sydney and $\frac{1}{4}$ mile below Mary Lake, on lot 25, concession 5, Township of Stephenson, Muskoka District.

Records Available—Discharge measurements from April, 1915. Daily gauge heights from April 16, 1915.

Drainage Area—560 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches and fastened to abutment on left upstream side of bridge. Zero of gauge (elev. 7.03 feet) is referred to a bench mark (elev. 24.78 feet) painted on top of right abutment, downstream side, and a bench mark (elevation 17.71), painted on side of right abutment, upstream side.

Channel—Straight for about 1,500 feet above and 500 feet below gauging station. Both banks are high, wooded, and not liable to overflow. The bed of the channel is composed of gravel and rock.

Discharge Measurements—Made from highway bridge with a small Price current meter.

Winter Flow—Open water conditions throughout the year.

Regulation—The operation of dam at Mary Lake during certain periods of the year causes fluctuation at the gauge.

Accuracy—The rating curve is well defined, and estimates of discharge are good.

Observer—Donald McClure, Port Sydney.

Discharge Measurements of Muskoka River (North Branch) near Port Sydney for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 10.....	Ronald, F.....	55	337	3.37	9.37	1135
Dec. 18.....	"	54	339	3.00	9.32	1018
1919						
Feb. 3.....	"	51	316	2.15	8.86	678
Mar. 18.....	"	56	359	4.03	9.70	1627
Apr. 15.....	"	58	450	5.06	11.24	2563
May 21.....	"	55	342	3.07	9.30	1051
June 10.....	"	53	336	2.22	9.23	845
July 9.....	"	48	273	.72	7.99	197
Aug. 21.....	Hatton, M.....	52	302	1.61	8.51	486
Sept. 25.....	Ronald, F.....	55	348	3.42	9.45	1179

Daily Gauge Height in feet, and Discharge in second-feet, of Muskoka River (North Branch) near Port Sydney for year ending September 30th, 1919

5.

H. E. F. (iii)	October	November		December		January		February		March		April		May		June		July		August		September		
		Gauge Ht., Feet	Dis- charge Ht., Sec.-ft.																					
		Gauge Ht., Feet	Dis- charge Ht., Sec.-ft.																					
1	7.83	148	9.08	885	9.20	970	9.78	1400	8.86	730	8.28	384	10.76	2170	9.61	1270	10.20	1740	7.99	225	7.74	114	7.86	162
2	7.83	148	8.99	825	9.20	970	9.78	1400	9.03	850	10.78	390	10.78	2180	9.72	1560	10.09	1650	7.99	225	7.70	100	7.86	162
3	7.83	148	8.99	825	9.20	970	9.78	1400	9.20	730	10.78	395	10.70	2120	10.82	2220	9.07	880	7.99	225	7.70	100	7.86	162
4	8.49	500	8.99	825	9.20	970	9.70	1340	8.86	730	10.78	400	10.99	2350	10.59	2030	9.51	1190	8.09	280	7.78	128	7.86	162
5	9.08	885	8.74	650	9.20	970	9.61	1270	8.82	705	10.78	405	10.97	2340	10.51	1970	9.05	865	8.09	280	7.86	162	7.86	162
6	9.58	1240	8.74	650	9.30	850	9.61	1270	8.81	695	10.78	411	10.86	2250	10.57	2020	9.11	910	8.05	258	7.76	121	7.86	162
7	9.58	1570	8.58	550	9.03	850	8.86	730	8.78	675	10.78	417	10.65	2080	10.24	1760	9.11	910	8.05	258	7.74	114	7.86	162
8	9.99	1570	8.58	550	9.03	850	8.86	730	8.78	675	10.78	423	10.57	2020	10.32	1820	9.13	920	7.99	225	7.74	114	7.90	180
9	9.24	1000	9.74	1370	9.03	850	8.86	730	8.78	675	8.36	428	10.65	2080	10.34	1830	9.13	920	7.99	225	7.74	114	7.90	180
10	9.24	1000	9.74	1370	9.03	850	8.78	730	8.78	675	8.41	456	10.80	2200	10.43	1900	9.05	865	7.99	225	7.74	114	7.95	205
11	9.33	1060	10.08	1640	9.03	850	8.78	675	8.78	660	8.41	456	11.24	2550	10.24	1760	8.82	705	7.99	225	7.74	114	7.95	205
12	9.33	1660	9.24	1000	9.03	850	8.78	675	8.74	650	8.41	456	11.40	2680	9.95	1540	8.74	650	7.99	225	7.74	114	7.95	205
13	9.41	1120	9.24	1000	9.11	905	8.78	675	8.91	765	8.70	620	11.28	2580	9.40	1110	7.99	225	7.93	195	7.74	114	7.82	144
14	9.41	1120	9.24	1000	9.11	905	8.78	675	8.65	590	9.11	905	11.26	2570	9.16	1050	7.88	171	7.88	171	7.76	121	7.78	128
15	9.33	1060	9.24	1000	9.03	850	8.78	675	8.63	620	9.05	865	11.24	2550	9.34	1070	7.86	162	7.93	195	7.78	128	7.91	185
16	9.33	1060	9.24	1000	9.03	850	8.78	675	8.68	610	9.07	880	11.30	2600	9.13	920	8.36	428	7.88	171	7.78	128	7.91	185
17	9.33	1060	9.24	1000	9.03	850	8.78	675	8.63	580	9.09	895	11.71	2910	9.51	1190	8.57	545	7.86	162	7.78	128	7.91	185
18	9.33	1660	9.24	1000	9.03	850	8.78	675	8.65	590	9.51	1190	12.36	3430	8.97	810	8.53	520	7.86	162	7.85	158	7.91	185
19	8.91	765	9.24	1000	8.78	1400	8.78	675	8.65	590	9.50	1180	12.36	3430	9.72	1360	8.32	406	7.84	162	7.82	246	7.91	185
20	8.74	650	9.24	1000	9.78	1400	8.95	795	8.63	580	10.28	1790	12.07	3200	9.57	1240	8.28	384	7.74	114	8.22	351	7.91	185
21	8.74	650	9.08	885	9.45	1150	8.95	795	8.59	555	10.59	2030	11.86	3030	9.32	1050	8.05	258	7.74	114	8.61	565	8.03	246
22	8.58	550	9.08	885	9.45	1150	8.95	795	8.61	565	10.53	1980	11.76	2950	9.32	1050	8.01	236	7.74	114	8.85	725	8.74	650
23	9.33	1060	8.91	765	9.36	1080	8.95	795	8.61	565	10.36	1850	10.51	1970	9.78	1400	7.99	225	7.74	114	8.68	610	9.68	1320
24	9.33	1060	8.91	765	9.36	1080	8.86	730	8.61	565	10.44	1910	10.63	2060	10.30	1800	7.99	225	7.74	114	8.43	466	9.61	1270
25	9.08	885	8.91	765	9.36	1080	8.86	730	8.34	417	10.49	1950	11.59	2830	11.01	2370	8.03	246	7.74	114	8.28	384	9.43	1130
26	8.99	825	9.08	885	10.20	1740	8.86	730	8.15	312	10.53	1980	11.72	2920	11.24	2550	8.21	346	7.85	158	7.88	171	9.30	1040
27	8.99	825	9.08	885	10.20	1740	8.86	730	8.20	340	10.61	2050	11.55	2800	11.11	2450	8.36	428	7.86	162	7.86	815	8.46	483
28	8.99	825	9.08	885	10.20	1740	8.86	730	8.24	362	11.24	2550	11.45	2720	10.53	2030	8.15	312	7.86	162	7.86	828	8.46	384
29	9.33	1060	9.08	885	9.86	1470	9.03	850	8.86	112	11.18	2500	10.28	2660	10.53	1980	7.99	225	7.86	162	7.86	162	8.28	384
30	9.33	1060	9.08	885	9.86	1470	8.86	730	8.86	10.71	2130	10.36	1850	10.65	2080	10.51	1970	7.86	162	7.86	162	8.07	268	
31	9.33	1060	.....	.....	9.78	1400	8.86	730	.....	.....	10.65	2080	.....	10.51	1970	.....	7.86	162	.....	162	.....	.....	.....	.....

Monthly Discharge for Muskoka River (North Branch) at Port
Sydney for year ending September 30th, 1919

Drainage Area, 560 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1570	148	906	2.80	.28	1.62	1.87
November "	1640	550	921	2.93	.98	1.64	1.83
December "	1740	850	1164	3.11	1.52	2.08	2.40
January (1919)	1400	675	861	2.50	1.21	1.54	1.78
February	850	312	609	1.52	.56	1.09	1.14
March.....	2550	384	1173	4.55	.69	2.09	2.41
April	3430	1850	2532	6.12	3.30	4.52	5.04
May	2550	810	1644	4.55	1.45	2.94	3.39
June	1740	162	592	3.11	.29	1.06	1.18
July.....	280	114	185	.50	.20	.33	.38
August.....	725	100	210	1.29	.18	.38	.44
September.....	1320	128	370	2.36	.23	.66	.74
The year	3430	100	931	6.12	.18	1.66	22.57

Napanee River near Napanee

Location—At Mink's Bridge, three miles above Napanee, near lot 1, concession 1, Township of Camden, County of Addington.

Records Available—Discharge measurements from August, 1915, and gauge readings from September 8, 1915.

Drainage Area—300 square miles.

Gauge—A boxed chain gauge on the right bank of the river 400 feet above the section. Nine feet of standard gauge plates. When the gauge reads zero the elevation of the water is 97.93. Three feet of standard gauge plates secured to 2 x 6 scantling fastened to tree 10 feet west of chain gauge. This is used for extreme high water.

Channel and Control—The channel is curved above the section to within 20 feet of the bridge, and is straight for 300 feet below. The right bank is high, while the left is comparatively low and liable to overflow. The bed of the stream is composed of rocks and gravel, not likely to shift.

Discharge Measurements—Made by wading at low stages and from bridge at high stages.

Winter Flow—Relation of gauge height to discharge is affected by ice.

Regulation—There are several power developments on the upper part of the river, and also lumber dams on tributary waters.

Accuracy—Two daily readings give only fair mean daily gauge heights.

Observer—Mrs. Dan. O'Shaughnessy, Napanee.

Discharge Measurements of Napanee River near Napanee for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 15.....	Ronald, F.....	64	296	3.22	105.18	952
1919						
Jan. 10.....	".....	64	208	1.83	103.76	380(a)
Feb. 7.....	Hatton, M.....	64	142	1.65	102.85	234(a)
Mar. 12.....	Ronald, F.....	64	168	1.94	103.20	326(a)
" 24.....	".....	64	424	4.77	107.18	2,022
May 15.....	Hatton, M.....	64	302	3.71	105.30	1,122
" 15.....	".....	64	302	3.85	105.30	1,163
July 2.....	Ronald, F.....	64	134	1.69	102.60	226
Aug. 15.....	Hatton, M.....	61	37	1.05	101.14	39
Sept. 13.....	Ronald, F.....	57	40	1.05	101.18	42

(a). Ice measurement.

Daily Gauge Height in feet and Discharge in Second-feet of Napanee River near Napanee for year ending
September 30th, 1919

Oct.	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge Sec.-ft.																						
	Feet	Sec.-ft.																						
1 101.85	108	103.93	565	103.76	510	104.81	690	103.01	297	104.18	583	107.10	1800	104.35	705	106.18	1430	102.60	230	101.10	38	101.10	38	101.10
2 101.85	108	103.85	540	103.76	510	104.73	660	103.01	252	103.60	411	106.31	1480	104.38	715	105.89	1320	102.51	214	101.05	35	101.10	38	101.10
3 101.89	113	103.93	565	103.76	510	104.73	660	103.01	252	103.26	329	106.01	1360	104.38	715	105.72	1250	102.43	199	101.01	33	101.05	35	101.05
4 101.93	118	103.85	540	103.51	441	104.60	620	102.93	236	102.97	264	105.93	1330	105.10	1000	105.51	1160	102.43	199	101.14	40	101.01	33	101.01
5 101.93	118	103.85	540	103.51	441	104.51	590	102.89	228	103.35	350	105.93	1330	105.68	1230	105.18	1160	102.43	199	101.18	43	101.01	33	101.01
6 102.05	126	103.85	540	103.51	441	104.51	540	103.85	255	103.47	575	105.10	1220	105.68	1230	105.18	1160	102.43	199	101.18	43	101.01	33	101.01
7 102.55	221	103.85	540	103.85	540	104.43	565	102.85	221	103.01	272	105.43	1130	105.01	965	105.10	1000	102.26	170	101.14	40	101.01	33	101.01
8 102.78	262	103.85	540	103.68	488	104.43	565	102.85	221	102.85	240	105.43	1130	104.97	950	104.60	800	102.35	186	101.10	38	100.93	28	100.93
9 102.68	246	103.85	540	103.59	463	104.51	590	102.60	177	102.93	256	105.43	1130	104.89	915	104.35	705	102.26	170	101.10	38	100.97	30	100.97
10 102.43	199	103.85	540	103.81	525	103.85	398	102.51	162	103.18	310	105.31	1080	104.85	900	104.35	645	102.42	198	100.97	30	100.97	30	100.97
11 102.43	199	103.81	525	103.68	488	103.81	540	103.81	525	103.85	398	102.51	162	103.18	310	105.31	1080	104.85	900	104.35	645	102.42	198	100.97
12 102.43	199	103.81	525	103.76	510	103.43	419	103.76	427	102.47	155	103.18	310	105.31	1080	104.85	900	104.35	645	102.42	198	100.97	30	100.97
13 102.51	214	103.81	525	103.35	398	103.81	441	102.43	148	103.31	340	105.43	1130	105.43	1230	103.68	848	101.85	108	101.01	33	101.01	33	101.01
14 102.60	230	103.81	525	104.01	590	103.81	441	102.43	148	102.81	232	105.35	1100	105.35	1100	103.68	488	101.85	108	101.01	33	101.01	33	101.01
15 102.68	246	103.76	510	103.93	565	103.64	396	102.26	122	102.60	194	105.26	1060	105.22	1050	103.43	419	101.80	108	102.01	33	100.93	28	100.93
16 102.64	238	103.76	510	103.93	565	103.60	386	102.26	122	102.60	194	105.26	1060	105.22	1050	103.43	419	101.80	108	102.01	33	100.93	28	100.93
17 102.60	230	103.85	540	103.93	565	103.68	406	102.26	122	102.60	194	105.39	1120	105.35	1100	103.35	398	101.72	192	100.93	28	100.93	28	100.93
18 102.68	246	103.85	540	103.97	575	103.64	396	102.22	117	102.14	2220	105.93	1330	105.10	1000	103.14	347	101.43	62	101.01	33	100.93	28	100.93
19 102.72	254	103.85	550	103.93	565	103.51	364	102.18	112	102.18	198	105.68	1230	105.10	1000	103.01	317	101.43	62	100.92	28	100.93	28	100.93
20 102.84	279	104.10	620	103.93	535	103.53	345	102.26	122	102.16	1400	105.51	1160	105.14	1020	102.93	299	101.43	62	101.05	33	100.93	28	100.93
21 103.38	406	104.18	645	103.93	535	103.31	340	102.26	122	102.16	1400	105.43	1130	106.14	1420	102.18	157	101.51	70	101.39	58	101.10	38	100.93
22 103.18	356	104.09	615	104.18	580	103.26	306	102.26	122	102.16	1470	105.35	1100	106.35	1500	105.18	130	103.22	66	101.47	66	101.10	38	100.93
23 102.84	279	104.01	590	104.43	660	103.47	354	102.30	128	102.16	1820	105.18	1030	107.47	1950	102.51	214	101.43	62	101.01	33	101.05	35	101.05
24 102.76	262	103.93	565	104.51	690	104.10	525	102.43	148	102.18	1830	105.01	965	107.35	1900	102.35	185	101.47	62	101.10	33	100.93	28	100.93
25 102.84	279	103.93	565	104.93	735	103.76	427	102.43	148	102.18	1830	104.85	900	107.35	1900	102.43	199	101.26	62	101.10	33	100.93	28	100.93
26 103.10	358	103.89	550	104.93	735	103.68	406	102.30	128	102.18	1830	104.85	900	107.35	1900	102.43	199	101.26	62	101.10	33	100.93	28	100.93
27 103.43	419	103.72	565	104.91	765	103.01	364	102.26	122	102.16	1880	104.76	865	107.35	1900	102.51	230	101.22	45	101.14	40	100.93	28	100.93
28 104.18	645	103.68	488	105.01	765	103.39	336	102.20	114	102.26	1860	104.60	800	107.22	1850	103.51	441	101.10	38	100.93	28	100.93	28	100.93
29 104.60	800	103.85	540	105.10	800	103.35	326	102.20	114	102.26	1860	104.47	750	107.10	1800	103.14	347	101.26	48	101.01	33	100.93	28	100.93
30 104.78	870	103.85	540	104.89	720	103.31	317	102.20	114	102.26	1860	104.26	670	107.10	1800	102.68	246	101.26	48	101.05	35	101.05	35	101.05
31 104.26	670	103.72	565	104.85	705	103.09	268	102.20	114	102.26	1860	104.01	66	106.68	1630	103.01	101.18	43	101.10	38	100.93	28	100.93	

Monthly Discharge of Napanee River near Napanee for year ending
September 30th, 1919

Drainage Area, 300 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	870	108	300	2.90	.36	1.00	1.15
November "	645	500	547	2.15	1.67	1.82	2.03
December "	800	398	578	2.67	1.33	1.93	2.22
January (1919)	705	268	451	2.35	.89	1.50	1.73
February	297	112	166	.99	.37	.55	.57
March.....	2,530	194	1,021	8.43	.65	3.40	3.92
April.....	1,800	670	1,133	6.00	2.23	3.78	4.22
May.....	1,950	705	1,283	6.50	2.35	4.28	4.93
June	1,430	157	574	4.77	.52	1.91	2.13
July	230	38	110	.77	.13	.37	.43
August	58	18	35	.19	.06	.12	.14
September	38	21	32	.13	.07	.11	.12
The year	2,530	18	521	8.43	.06	1.74	23.59

Petawawa River near Petawawa

Location—About 1½ miles southwest of Petawawa station above C.P.R. bridge, near lot 15, concession 7, township of Petawawa, County of Renfrew.

Records Available—Discharge measurements from October, 1915, and daily gauge heights from November 5, 1915.

Drainage Area—1,572 square miles.

Gauge—Gauge is fastened to large rock in river, back of Rantz's house, 1,000 feet above section and 200 feet above the head of the rapids.

Channel and Control—The controlling section is a few hundred yards above the metering section. The river is straight for a few hundred feet each side of the section, but is crooked and fast for two miles below the section. The soundings for depths are taken for each metering as the water is fast and the river bed of stones may change slightly between meterings, and the depths do not change the same as the gauge readings.

Discharge Measurements—The discharge measurements for normal and low flows, summer and winter, are made by wading in fast water near the end of the straight stretch in the river downstream from the gauge. At high water measurements are made from the road bridge leading to Petawawa Military Camp.

Winter Flow—The control here is at fast water and only slightly affected by ice.

Accuracy—Gauge readings twice daily give good mean daily gauge height as the fluctuation at the gauge is slow.

Observer—Elsa Rantz, Petawawa.

Discharge Measurements of Petawawa River near Petawawa for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 4.....	Ronald, F.	164	453	4.00	102.75	1,819
1919						
April 22.....	"	164	879	6.24	104.67	5,485
May 3.....	"	164	782	6.21	104.67	4,869
June 1.....	"	164	910	5.55	104.50	5,059
" 25.....	"	164	633	4.88	103.33	3,089
July 24.....	Hatton, M.	164	535	4.33	102.75	2,315
Sept. 11.....	Ronald, F.	164	264	3.68	101.92	970

Daily Gauge Height in feet and Discharge in second-feet of Petawawa River near Petawawa for year ending September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September	
Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1 1 101.83	765	102.42	1540	102.75	2000	102.58	1760	102.33	1410	102.68	1070	102.50	1650	104.67	5180	104.58	5260	103.17	2640	102.50	1650	101.67	575
2 101.83	765	102.42	1540	102.75	2000	102.58	1760	102.29	1360	102.08	1070	102.50	1650	104.67	5180	104.38	4820	103.12	2560	102.42	1540	101.67	575
3 101.83	765	102.42	1540	102.75	2000	102.58	1710	102.25	1300	102.08	1070	102.50	1650	104.67	5180	104.21	4470	103.04	2440	102.33	1410	101.58	480
4 101.83	765	102.42	1540	102.75	2000	102.50	1650	102.25	1300	102.08	1070	102.54	1710	104.67	5180	104.17	4390	103.00	2380	102.33	1410	101.58	480
5 102.00	970	102.42	1540	102.67	1890	102.50	1650	102.25	1300	102.08	1070	102.58	1760	104.62	5180	104.08	4210	103.00	2380	102.25	1300	101.58	480
6 102.00	1020	102.42	1540	102.67	1890	102.50	1650	102.25	1300	102.00	970	102.62	1820	104.58	5180	104.12	4290	102.96	2320	102.25	1300	101.58	480
7 102.16	1180	102.46	1590	102.67	1890	102.50	1650	102.25	1300	102.00	970	102.71	1940	104.54	5170	104.17	4390	102.92	2260	102.21	1240	101.67	575
8 102.25	1300	102.50	1650	102.67	1890	102.50	1650	102.25	1300	102.00	970	103.00	2380	104.38	4820	104.21	4470	102.92	2260	102.12	1130	101.71	620
9 102.25	1300	102.50	1650	102.67	1890	102.50	1650	102.25	1300	102.00	970	103.04	2440	104.29	4630	104.46	4990	102.92	2260	102.08	1070	101.96	920
10 102.25	1300	102.50	1650	102.62	1820	102.50	1650	102.25	1300	102.04	1020	103.25	2770	104.21	4470	104.67	5480	102.94	2260	102.04	1070	101.96	920
11 102.25	1300	102.50	1650	102.62	1820	102.50	1650	102.25	1300	102.00	1070	103.50	3170	104.17	4390	104.30	5480	102.94	2260	102.04	1070	101.96	920
12 102.29	1360	102.50	1650	102.62	1820	102.50	1650	102.25	1300	102.00	970	103.83	3740	104.17	4390	104.67	5480	102.92	2260	102.00	970	101.83	765
13 102.33	1410	102.54	1710	102.67	1890	102.46	1590	102.17	1190	102.00	970	104.04	4140	104.12	4290	104.62	5360	102.88	2200	102.00	970	101.83	765
14 102.29	1360	102.58	1760	102.67	1890	102.42	1540	102.17	1190	102.00	970	104.08	4120	104.17	5170	102.75	2000	102.00	970	101.83	765	101.75	
15 102.25	1300	102.58	1760	102.75	2000	102.46	1590	102.17	1190	102.00	970	104.08	4210	104.30	4650	102.82	2110	101.88	825	101.75	670		
16 102.25	1300	102.58	1760	102.75	2000	102.50	1650	102.17	1190	102.00	970	104.12	4290	102.79	2060	101.84	825	101.75	670				
17 102.25	1300	102.58	1760	102.71	1940	102.50	1650	102.17	1190	102.00	970	104.21	4470	104.00	4060	102.96	2320	101.83	765	101.75	670		
18 102.25	1300	102.62	1820	102.67	1890	102.50	1650	102.17	1190	102.08	1070	104.29	4630	104.00	4060	103.86	3800	103.32	2900	101.83	765	101.67	575
19 102.25	1300	102.62	1820	102.67	1890	102.42	1540	102.17	1190	102.00	1070	104.46	4990	104.04	4060	103.70	3670	103.88	3830	101.83	765	101.67	575
20 102.25	1300	102.62	1820	102.67	1890	102.42	1540	102.17	1190	102.12	1130	104.50	5080	103.87	3820	103.54	3240	102.67	2000	101.83	765	101.67	575
21 102.21	1240	102.79	2060	102.62	1820	102.38	1480	102.12	1130	102.17	1190	104.54	5170	103.92	3910	103.42	3040	102.71	1940	101.83	765	101.67	575
22 102.12	1130	102.92	2260	102.67	1890	102.33	1480	102.12	1080	102.21	1240	104.67	5480	103.96	3880	103.42	3040	102.75	2000	101.83	765	101.67	575
23 102.00	970	102.92	2260	102.67	1890	102.33	1480	102.08	1070	102.25	1300	104.67	5480	104.33	4710	103.46	3110	102.75	2000	101.83	765	101.67	575
24 102.08	1070	102.92	2260	102.67	1890	102.33	1480	102.17	1190	102.25	1300	104.67	5480	104.62	5560	103.46	3110	102.75	2000	101.83	765	101.67	575
25 102.08	1070	102.87	2180	102.67	1890	102.33	1410	102.17	1190	102.29	1360	104.67	5480	104.83	5580	103.38	2980	102.67	2000	101.83	765	101.67	575
26 102.12	1130	102.83	2120	102.67	1890	102.33	1410	102.08	1070	102.33	1420	104.67	5480	104.83	5580	103.33	2900	102.75	2000	101.79	720	101.67	575
27 102.17	1190	102.35	1440	102.67	1890	102.33	1410	102.08	1070	102.42	1540	104.67	5480	104.83	5580	103.33	2900	102.75	2000	101.79	720	101.67	575
28 102.16	1100	102.35	1440	102.67	1890	102.33	1410	102.08	1070	102.50	1530	104.67	5480	104.83	5580	103.25	2770	102.62	1820	101.75	670	101.67	575
29 102.38	1480	102.75	2000	102.58	1760	102.33	1410	102.33	1410	102.50	1760	104.67	5480	104.79	5780	103.12	2560	102.54	1710	101.75	670	101.67	575
30 102.42	1540	102.75	2000	102.58	1760	102.33	1410	102.33	1410	102.50	1760	104.67	5480	104.79	5780	103.00	2380	102.50	1650	101.75	670	101.67	575
31 102.42	1540	102.75	2000	102.58	1760	102.33	1410	102.33	1410	102.50	1760	104.67	5480	104.79	5780	102.50	1650	101.75	670	101.67	575		

Monthly Discharge of Petawawa River near Petawawa for year ending
September 30th, 1919

Drainage Area, 1,572 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)..	1,540	765	1,196	.98	.49	.76	.88
November ..	2,260	1,540	1,821	1.44	.98	1.16	1.29
December ..	2,000	1,760	1,881	1.27	1.12	1.20	1.38
January (1919)..	1,760	1,410	1,578	1.12	.90	1.00	1.15
February ..	1,410	1,070	1,212	.90	.68	.77	.80
March ..	1,760	970	1,180	1.12	.62	.75	.86
April ..	5,480	1,650	3,906	3.49	1.05	2.48	2.77
May ..	5,880	3,820	4,890	3.74	2.43	3.11	3.58
June ..	5,480	2,360	4,025	3.49	1.50	2.56	2.86
July ..	3,830	1,650	2,203	2.44	1.05	1.40	1.61
August ..	1,650	670	955	1.05	.43	.61	.70
September ..	970	480	628	.62	.31	.40	.45
The year ..	5,880	480	2,125	3.74	.31	1.35	18.35

Tay River near Glen Tay

Location—Near lots 20 and 21, concession II, Township of Bathurst, County of Lanark, at the highway bridge south of the Village of Glen Tay, and east of the auxiliary plant of the Canadian Electric & Water Company, Limited, of Perth and Ottawa.

Records Available—Discharge measurements July, 1915, and gauge readings from July 10, 1915.

Drainage Area—204 square miles.

Gauge—Vertical steel staff 0 to 3 feet fastened to the pier of bridge one foot above section.

Channel and Control—The channel is straight from the dam 150 feet above and straight for 250 feet below the section. The banks are high, and not liable to overflow. The bed of the river is composed of shale and stones, not shifting. The flow is confined between the bridge abutments at all stages. The control is a short distance below the section, and the flood flow is likely to disturb it to some extent.

Discharge Measurements—Made by wading at ordinary stages, and from the bridge at very high stages.

Winter Flow—Channel at section remains free from ice during winter, but relation of gauge height to discharge is affected by ice formation below the section.

Regulation—The river is dammed immediately above the section and one mile further up, for power purposes, and the Department of Railways and Canals operate a dam at the foot of Bob's Lake for regulating for canal purposes.

Accuracy—On April 18th, 1919, the dam above the section collapsed and carried away part of the bridge. The debris was deposited about 100 feet down-stream and has backed the water up to the extent of about one foot at the gauge. Allowance has been made for this back-water in estimating the daily flow.

Observer—Paul Griffin, Manion P.O.

Discharge Measurements of Tay River near Glen Tay for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
December 3.....	Ronald, F.....	40	56	3.71	94.42	208
1919						
January 17.....	"	40	59	4.54	94.48	268 (a)
February 13.....	"	39	46	3.48	94.30	160 (a)
March 26.....	"	47	110	4.49	95.55	499
May 8.....	"	50	130	3.60	95.61	483 (b)
" 30.....	"	50	179	3.85	96.48	690 (b)
June 20.....	"	50	149	2.70	95.88	403 (b)
August 7.....	Hatton, M	50	132	1.53	95.55	202 (b)
September 9.....	Ronald, F.....	50	142	1.80	95.65	256 (b)

(a) Ice measurement.

(b) Backwater from debris below section.

Daily Gauge Height in feet and Discharge in second-feet of Tay River near Glen Tay for year ending September 30th 1919

Oct	November	December	January	February			March			April			May			June			July			August			September		
				Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
				Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet
1 94.40	203	94.61	276	94.48	231	94.27	158	94.51	242	94.28	161	94.55	256	95.57	469	96.30	590	95.80	332	95.59	259	95.65	252	95.65	252	95.65	252
2 94.52	245	94.45	224	94.48	210	94.51	242	94.44	217	94.36	189	94.36	262	94.57	262	94.55	256	95.75	530	96.30	590	95.80	332	95.57	252	95.65	252
3 94.34	182	94.46	224	94.42	210	94.42	242	94.44	217	94.57	262	94.36	189	94.34	182	94.55	256	95.71	520	96.30	590	95.80	332	95.59	259	95.65	252
4 94.31	172	94.53	248	94.44	210	94.57	262	94.36	189	94.34	182	94.55	256	95.84	605	96.30	590	95.80	332	95.53	238	95.53	238	95.65	252		
5 94.48	231	94.53	248	94.42	210	94.55	256	94.53	248	94.48	231	94.55	256	95.96	605	96.30	590	95.78	325	95.75	252	95.63	245	95.63	245		
6 94.40	203	94.50	238	94.40	203	94.55	256	94.51	242	94.30	168	94.63	284	95.92	590	96.30	590	95.75	325	95.53	238	95.63	245	95.63	245		
7 94.51	242	94.50	238	94.48	231	94.55	256	94.38	196	94.40	203	94.80	343	95.80	550	96.30	590	95.73	308	95.59	259	95.63	245	95.63	245		
8 94.46	224	94.48	231	94.38	196	94.55	256	94.53	248	94.38	196	94.80	343	95.80	550	96.30	590	95.73	308	95.59	259	95.63	245	95.63	245		
9 94.46	224	94.50	238	94.44	217	94.55	256	94.42	210	94.44	217	94.95	364	95.63	441	96.30	590	95.69	294	95.59	231	95.63	245	95.63	245		
10 94.44	217	94.57	262	94.63	284	94.71	312	94.46	224	94.30	168	94.86	364	95.63	441	96.21	555	95.71	301	95.65	252	95.63	255	95.63	255		
11 94.40	203	94.55	256	94.46	224	94.55	256	94.42	210	94.40	203	95.05	430	95.84	515	96.13	530	95.71	301	95.71	273	95.63	255	95.63	255		
12 94.55	256	94.55	256	94.30	168	94.51	242	94.28	161	94.46	224	95.21	486	95.96	555	96.13	530	95.67	287	95.71	273	95.58	238	95.58	238		
13 94.36	189	94.55	256	94.40	203	94.55	256	94.42	210	94.40	203	95.00	413	95.96	555	96.13	530	95.67	287	95.71	273	95.58	238	95.58	238		
14 94.42	210	94.32	175	94.44	217	94.55	256	94.42	210	94.44	217	94.38	196	94.80	343	95.88	530	96.05	500	95.69	287	95.71	273	95.48	203		
15 94.42	210	94.32	175	94.32	175	94.55	256	94.53	248	94.28	161	94.38	196	94.61	304	95.71	500	95.71	301	95.71	273	95.46	196	95.46	196		
16 94.40	203	94.32	175	95.05	430	94.53	248	94.42	210	94.42	210	94.42	210	94.71	312	95.71	469	96.00	483	95.71	301	95.71	273	95.44	189		
17 94.33	178	94.19	130	94.86	364	94.53	248	94.42	210	94.42	210	94.42	210	94.71	312	95.71	469	96.00	483	95.71	301	95.71	273	95.44	189		
18 94.25	150	94.55	256	94.69	304	94.53	248	94.42	210	95.38	545	96.93	945	95.80	500	95.96	469	95.96	469	95.71	301	95.71	273	95.42	182		
19 94.31	172	94.59	270	94.55	256	94.53	248	94.42	210	95.93	740	95.71	520	95.71	469	95.94	462	95.71	301	95.71	273	95.42	182	95.42	182		
20 94.25	150	94.59	270	94.55	256	94.53	248	94.42	210	94.36	189	96.13	810	96.30	725	95.71	469	95.90	448	95.67	287	95.71	273	95.42	182		
21 94.40	203	94.59	270	94.57	256	94.53	248	94.42	210	94.38	196	96.42	910	96.09	650	96.05	500	95.71	301	95.71	273	95.42	182	95.42	182		
22 94.34	182	94.61	276	94.57	262	94.83	354	94.42	210	94.42	210	95.69	910	96.10	605	96.67	805	95.95	843	95.71	301	95.71	273	95.42	182		
23 94.34	182	94.59	270	94.59	270	94.51	242	94.40	203	95.38	545	96.93	735	95.55	462	97.88	1230	95.84	346	95.65	280	95.67	259	95.42	182		
24 94.31	172	94.59	270	94.55	256	94.53	248	94.42	210	95.93	740	95.71	520	95.71	469	95.84	346	95.84	346	95.71	301	95.71	273	95.42	182		
25 94.44	217	94.50	238	94.42	210	94.44	217	94.51	242	94.44	217	94.36	189	96.13	810	96.30	590	95.80	332	95.65	280	95.65	252	95.36	161		
26 94.38	196	94.42	210	94.42	210	94.44	217	94.33	178	94.42	210	95.69	910	96.09	650	96.80	805	95.82	340	95.63	273	95.42	182	95.36	161		
27 94.23	144	94.42	210	94.47	210	94.48	231	94.31	172	95.55	605	95.55	462	96.80	850	95.88	346	95.88	346	95.65	280	95.65	252	95.40	175		
28 94.36	189	94.42	210	94.47	210	94.48	231	94.30	172	95.55	605	95.55	462	96.80	850	95.88	346	95.88	346	95.65	280	95.65	252	95.36	168		
29 94.53	248	94.46	224	94.61	270	94.53	248	94.55	256	94.55	248	94.55	256	95.55	662	96.55	765	95.88	360	95.63	273	95.67	259	95.36	161		
30 94.53	248	94.48	231	94.63	284	94.53	248	94.55	256	94.55	248	94.55	256	95.55	662	96.55	765	95.84	346	95.61	266	95.61	266	95.34	154		
31 94.59	270	94.51	242	94.61	276	94.51	242	94.55	256	94.55	248	94.55	256	95.55	662	96.55	765	95.82	340	95.61	266	95.61	266	95.34	154		
32 94.59	270	94.51	242	94.61	276	94.51	242	94.55	256	94.55	248	94.55	256	95.55	662	96.55	765	95.82	340	95.61	266	95.61	266	95.34	154		

Monthly Discharge of Tay River near Glen Tay for year ending
September 30th, 1919

Drainage Area, 204 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
	—	—	—	—	—	—	
October (1918)	270	144	204	1.32	.71	1.00	1.15
November "	276	130	234	1.35	.64	1.15	1.28
December "	444	168	262	2.18	.82	1.28	1.48
January (1919)	354	158	252	1.74	.77	1.24	1.43
February	262	116	208	1.28	.57	1.02	1.06
March.....	1,010	161	383	4.95	.79	1.88	2.17
April.....	945	256	430	4.63	1.25	2.11	2.35
May.....	1,230	441	631	6.03	2.16	3.09	3.56
June.....	590	332	475	2.89	1.63	2.33	2.60
July.....	332	259	296	1.63	1.27	1.45	1.67
August.....	287	231	261	1.41	1.13	1.28	1.48
September	255	154	206	1.25	.75	1.01	1.13
The year	1,230	116	321	6.03	.57	1.57	21.36

York River near Bancroft

Location—At the highway bridge one and a half miles below Bancroft, near lots 53 and 54, west of the Hastings Road, Township of Faraday, County of Hastings.

Records Available—Discharge measurements from July, 1915. Daily gauge heights from July 16, 1915.

Drainage Area—374 square miles.

Gauge—Vertical standard gauge plates 0 to 6 ft. secured on the upstream face of the right bridge pier near the west corner.

Channel and Control—The channel is straight for 400 feet above and 250 feet below the section. The banks are high and sandy, not liable to overflow. The bed is composed of gravel. Flow takes place in three channels under the bridge at high stages, and in two channels at lower stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice materially affects the open-water relation of gauge heights to discharge, and frazil ice at times makes meterings difficult.

Regulation—The dam at Bancroft gives very small storage, and the plants there do not use the entire flow. On account of the electrical plant working at night, and the other mills during the day, daily gauge readings give fairly accurate figures for the mean daily stage. Some of the tributary streams are controlled by dams for storage and driving purposes for the lumber industry.

Accuracy—As the river bed is composed of gravel, slight movement no doubt takes place without changing the general profile and section.

Observer—H. McNevin, Bancroft.

Discharge Measurements of York River near Bancroft for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 13.....	Ronald, F.....	68	393	2.20	103.94	864
1919						
Jan. 8.....	".....	62	344	1.92	103.25	660
Feb. 5.....	Hatton, M.....	68	274	1.39	102.17	380(a)
Mar. 13.....	Ronald, F.....	65	223	1.04	101.31	233(a)
April 18.....	Hatton, M.....	68	322	1.84	102.87	592
Aug. 13.....	".....	58	185	.79	100.77	147
Sept. 15.....	Ronald, F.....	62	198	.77	100.83	153

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of York River near Bancroft for year ending

September 30th, 1919

Gauge Ht. Feet	Dis-charge Ht. Feet	October			November			December			January			February			March			April			May			June			July			August			September			
		Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.			Sec.-ft.						
		Gauge Ht., Feet	Gauge Dis-charge Ht., Feet																																			
1	101.08	186	102.89	560	103.75	780	103.54	720	102.80	515	101.58	344	102.54	480	103.17	630	106.00	1440	103.21	635	101.38	244	101.00	171														
2	101.25	218	103.08	605	104.95	1140	103.50	710	102.92	545	101.42	213	102.58	489	103.46	700	105.66	1540	103.38	680	101.15	200	101.00	171														
3	101.42	252	103.23	640	105.17	1200	103.42	690	102.67	487	101.38	205	102.42	455	104.95	1140	105.25	1220	103.29	655	101.08	186	101.00	186														
4	101.50	268	103.25	645	105.00	1150	103.40	650	102.40	430	101.42	213	102.42	455	104.75	1070	104.67	1500	102.54	480	101.08	186	101.00	171														
5	101.62	292	103.23	640	104.83	1100	104.25	930	102.25	398	101.38	205	102.46	464	104.83	1100	104.83	1100	101.67	302	101.00	171	101.00	171														
6	101.83	334	103.08	605	104.75	1070	104.67	1050	102.17	382	101.83	294	102.54	480	104.79	1090	105.23	1240	101.54	276	101.04	179	101.00	171														
7	102.42	456	103.04	600	104.67	1050	101.90	910	102.12	372	101.71	270	102.71	520	105.16	1200	105.62	1530	101.58	284	101.08	186	101.00	171													
8	102.58	489	103.00	590	104.46	990	101.75	775	102.08	364	101.69	266	102.87	560	105.62	1330	102.96	1530	101.42	252	101.04	179	101.00	171														
9	102.58	489	103.02	595	104.33	950	103.21	635	102.12	372	101.58	244	102.87	560	104.24	1280	104.29	1540	101.42	252	101.00	171	101.00	171														
10	102.58	489	103.08	605	104.25	930	103.25	650	102.83	228	103.04	600	105.42	1270	104.38	965	101.42	252	101.00	171	101.00	171																
11	102.58	489	103.01	590	104.17	905	103.62	745	102.83	520	101.54	256	102.71	520	104.42	975	104.38	965	101.42	252	101.12	194	101.04	179														
12	102.62	497	103.00	590	104.08	880	104.40	880	102.95	487	101.75	215	102.67	510	104.70	1060	104.38	965	101.42	252	101.04	179	100.96	164														
13	102.67	510	102.96	580	104.00	855	104.67	1050	101.67	416	101.67	282	102.67	510	104.83	1100	104.29	940	101.42	252	100.79	133	100.83	140														
14	102.67	510	102.92	570	104.08	880	104.58	995	101.62	427	101.54	272	102.58	489	105.42	1270	104.25	930	101.42	252	101.04	179	100.83	140														
15	102.67	510	103.29	655	104.10	885	103.08	585	101.83	314	101.54	256	102.37	445	105.42	1270	104.21	920	101.42	252	101.04	179	100.83	140														
16	102.67	510	103.33	670	104.12	890	102.67	487	101.92	332	101.37	222	102.29	428	105.02	1160	102.71	515	101.42	252	101.04	179	100.83	140														
17	102.67	510	103.25	645	103.54	850	103.98	550	102.50	415	101.33	215	102.37	445	105.00	1150	102.50	472	101.46	260	101.04	179	100.83	140														
18	102.69	515	103.92	830	102.50	548	101.92	333	101.80	308	102.54	480	104.96	1140	102.42	455	101.88	344	101.00	171	101.00	171	100.96	164														
19	102.71	515	103.55	675	103.83	805	102.50	451	101.75	298	101.83	314	103.46	700	104.83	1100	102.21	411	101.26	220	101.08	186	100.79	133														
20	102.71	515	103.73	780	102.50	451	101.83	314	102.00	348	104.08	880	102.38	447	102.04	376	101.00	171	101.00	171	101.00	171	100.83	140														
21	103.04	600	103.71	770	103.67	760	102.42	433	101.69	286	102.04	356	104.25	930	104.96	1140	101.92	352	101.58	284	101.08	186	100.83	140														
22	103.04	645	103.54	720	103.88	820	102.46	443	101.67	282	102.21	390	104.33	955	106.00	1440	101.83	334	103.16	625	101.08	186	100.83	140														
23	103.21	635	103.54	720	103.88	820	102.46	443	101.67	282	102.21	390	104.33	955	106.00	1440	101.83	334	103.16	625	101.08	186	100.83	140														
24	103.21	635	103.50	710	103.92	830	102.50	451	101.58	266	102.50	451	104.37	960	106.00	1440	101.67	302	103.25	650	101.08	186	100.83	140														
25	103.25	645	103.55	720	103.85	810	102.71	495	101.58	266	102.79	513	104.50	1000	106.00	1440	101.67	302	103.58	735	101.80	328	100.83	140														
26	103.25	645	103.55	780	103.75	840	102.44	438	101.58	266	103.12	615	105.21	1210	107.00	1440	101.67	302	103.83	805	101.08	186	100.79	133														
27	103.17	645	103.54	770	103.67	770	102.42	432	101.69	286	102.04	356	104.25	930	104.96	1140	101.67	302	102.17	403	101.08	186	100.83	140														
28	103.21	635	103.62	745	103.75	800	102.46	443	101.67	282	102.21	390	104.33	955	106.00	1440	101.83	334	103.16	625	101.08	186	100.83	140														
29	103.23	640	103.77	785	102.29	407	765	102.75	407	103.92	830	105.42	1270	107.00	1440	101.00	186	100.83	140	102.42	455	103.04	600	100.88	149													
30	103.25	645	103.75	780	102.25	398	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472
31	103.25	645	103.75	785	102.25	398	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472	103.42	900	104.21	920	102.50	472

NOTE—May 25th to 31st—Water above gauge—Estimated High Water—106.50

Monthly Discharge of York River near Bancroft of year ending
September 30th, 1919

Drainage Area, 374 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per square mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	645	186	502	1.72	.50	1.34	1.54
November "	785	560	658	2.10	1.50	1.76	1.96
December "	1,200	735	886	3.21	1.96	2.37	2.73
January ..(1919)	1,050	398	617	2.81	1.06	1.65	1.90
Febrary	545	266	371	1.46	.71	.99	1.03
March.....	830	205	362	2.22	.55	.97	1.12
April	1,270	428	705	3.40	1.14	1.89	2.11
May.....	1,590	447	1,191	4.25	1.20	3.18	3.67
June	1,440	302	724	3.85	.81	1.94	2.16
July.....	805	171	398	2.15	.46	1.06	1.22
August	328	133	185	.88	.36	.49	.56
September	186	86	152	.50	.23	.41	.46
The year	1,590	86	564	4.25	.23	1.51	20.50

Regular Stations

NORTHERN ONTARIO DISTRICT

River	Location	Drainage Area Sq.Miles	Township	District
aux Sables	at Massey	524	Salter	Sudbury
Blanche	near Englehart	430	Evanturel	Temiskaming
Frederickhouse.....	at Frederickhouse	1,260	Fournier and Clute	
Kapuskasing	at Kapuskasing	2,820	O'Brien	
Mattagami.....	at Smooth Rock Falls	3,970	Kendry	
Mississagi	at Iron Bridge	3,565	Gladstone	Algoma
"	at O'Neil's Farm	3,640	Thompson	
South	at Cox's Chute	166	Himsworth	Parry Sound
"	near Powassan	294	"	
Spanish	near Webbwood	4,340	Hallam	Sudbury
Sturgeon	near Smoky Falls	2,570	Field	Nipissing
Vermilion.....	near Whitefish	1,580	Graham	Sudbury
Wanapitei	at McVitties	1,190	Secord	

aux Sables River at Massey

Location—About 500 feet upstream from C. P. Ry. bridge, and $\frac{1}{4}$ mile northeast of railway station, in the Village of Massey, Township of Salter, Sudbury District.

Records Available—Discharge measurements from August, 1914. Daily gauge heights from June 10, 1915.

Drainage Area—524 square miles.

Gauge—A chain gauge has been established here reading zero with water at an elevation of 15.94 referred to a B.M. elevation 29.76 painted on top of rock on left bank at entrance to rapids. The gauge is located ten feet above the section.

Channel and Control—Straight for 1,000 feet above and 100 feet below the gauging station to a rapid. Both banks are high, rocky, wooded, and are not liable to overflow. The bed of the stream is composed of clay and gravel, practically permanent. The velocity is moderate, and one channel exists at all stages.

Discharge Measurements—Made by wading during low water periods. At high stages measurements are made from boat with a Price current meter.

Regulation—The operation of logging dams above cause fluctuations in gauge heights during the log-driving season.

Observer—Jas. Blight, Massey.

Discharge Measurements of aux Sables River at Massey for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 29.....	Loy, R	98	676	1.62	23.17	1099
Dec. 22.....	Taylor, J. R.	94	478	1.57	21.08	751
Jan. 18.....	"	91	246	1.87	19.27	459(a)
" 19.....	"	91	244	2.08	19.27	509(a)
Feb. 26.....	"	83	157	2.11	17.92	332(a)
May 5.....	"	96	786	1.67	24.44	1310
July 29.....	Loy, R	68	93	2.05	16.69	190
Sept. 29.....	Taylor, J. R.	96	725	1.61	23.74	1169

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of aux Sables River at Massey for year ending
September 30th, 1919

Oct.	November	December	January	February		March		April		May		June		July		August		September							
				Gauge Ht.	Discharge Ht.																				
				Feet	Sec.-ft.																				
1	17.11	234	22.19	1000	23.36	1120	19.94	575	18.77	394	18.11	357	23.27	1170	24.16	1320	24.27	1330	21.02	815	16.67	192	17.44	269	
2	17.11	234	21.27	855	23.52	1150	19.94	575	18.69	383	18.11	357	23.36	1190	24.06	1300	24.44	1360	20.69	760	16.67	192	17.36	261	
3	17.19	242	21.44	880	23.77	1190	19.94	575	18.52	359	18.02	345	23.44	1200	23.70	1240	24.27	1313	20.46	725	16.77	200	17.36	261	
4	17.27	251	21.44	880	22.02	910	19.94	575	18.44	348	18.11	357	23.44	1200	24.13	1310	24.97	1440	20.37	710	16.69	193	17.36	261	
5	18.11	357	21.27	855	22.36	965	19.94	575	18.44	348	18.11	357	23.44	1200	24.03	1290	24.11	1310	21.02	815	16.69	193	17.27	251	
6	18.77	454	21.27	855	22.61	1000	19.94	575	18.44	348	18.11	357	23.69	1240	24.44	1360	24.29	1340	19.44	560	16.69	193	17.27	251	
7	17.94	334	22.94	1120	22.61	1000	19.92	575	18.44	348	18.11	357	24.19	1520	24.94	1440	24.44	1360	19.11	510	16.69	193	17.27	251	
8	17.94	334	23.27	1170	22.52	990	19.90	570	18.44	348	18.11	357	24.69	1400	25.36	1510	24.44	1360	18.52	417	16.69	193	17.27	251	
9	17.77	310	23.27	1170	22.36	965	19.79	550	18.44	348	17.94	334	26.61	1510	24.36	1350	18.44	405	16.69	193	17.19	242			
10	17.94	334	23.27	1170	22.36	965	19.67	535	18.36	336	17.94	334	24.94	1440	24.19	1320	18.19	369	16.69	193	17.19	242			
11	18.02	345	23.27	1170	22.27	950	19.75	545	18.36	336	17.77	310	23.44	1200	23.86	1270	17.94	334	16.69	193	17.19	242			
12	18.19	369	23.94	1280	22.19	935	19.56	515	18.36	336	17.77	310	23.11	1150	23.86	1270	17.94	334	16.69	193	17.19	242			
13	18.44	405	22.94	1120	22.19	935	19.46	500	18.19	313	17.69	300	22.94	1120	24.11	1310	17.86	322	16.69	193	17.19	242			
14	18.61	430	22.61	1070	22.11	925	19.44	496	18.11	301	17.61	289	30.44	2330	22.44	1040	24.29	1340	17.86	322	16.69	193	17.19	242	
15	18.69	442	22.36	1030	22.02	910	19.34	480	18.11	301	17.77	310	29.61	2200	22.27	1010	24.11	1310	17.69	299	16.77	200	17.69	299	
16	18.52	417	21.94	960	21.85	880	19.23	464	18.11	301	17.94	334	29.02	2100	22.36	1030	23.86	1270	17.61	289	16.79	202	18.29	383	
17	18.52	417	22.77	1090	21.75	865	19.04	435	18.02	290	18.86	470	28.27	1980	24.19	1320	23.61	1230	17.44	269	16.77	200	18.52	417	
18	18.44	405	24.27	1330	21.57	835	19.27	470	18.02	290	19.19	520	28.27	1980	23.44	1200	17.36	261	16.86	209	19.44	560			
19	18.44	405	24.27	1330	21.23	785	19.27	470	17.86	272	19.86	630	28.14	2010	27.94	1930	23.69	1240	17.27	251	17.02	225	19.69	600	
20	18.44	405	24.36	1350	20.97	740	19.19	458	17.86	272	20.36	710	28.02	1940	27.61	1880	23.86	1270	17.11	234	17.19	242	17.19	295	
21	18.44	405	24.44	1360	20.79	710	19.19	458	17.77	273	21.19	840	27.77	1900	27.44	1850	24.11	1310	17.11	234	17.19	242	17.19	295	
22	18.36	393	24.44	1360	20.37	645	19.11	446	17.77	273	21.52	895	27.77	1900	27.44	1850	23.86	1270	17.02	225	17.36	261	21.11	830	
23	18.11	357	24.44	1360	20.44	655	19.02	432	17.77	284	21.94	960	27.44	1850	27.27	1820	23.44	1200	16.94	217	17.52	278	21.25	850	
24	18.36	393	24.44	1360	20.36	645	19.02	432	17.77	284	22.11	990	27.27	1820	27.36	1840	23.36	1190	16.86	209	17.69	299	21.65	915	
25	23.44	1200	24.27	1310	20.36	645	19.02	432	17.77	296	22.27	1010	26.86	1760	27.02	1780	23.02	1130	16.69	193	17.77	210	21.79	935	
26	24.27	1330	24.27	1310	20.36	645	18.94	420	17.86	322	22.69	1080	26.61	1720	22.69	1080	16.61	187	17.79	313	22.02	975			
27	25.19	1480	23.69	1210	20.27	630	18.94	420	18.02	345	22.86	1100	26.52	1700	22.52	1050	16.69	193	17.61	289	22.25	1010			
28	25.44	1520	23.36	1140	20.19	615	18.86	408	18.02	345	23.11	1150	25.61	1550	22.11	990	16.69	193	17.51	277	22.65	1070			
29	24.94	1440	23.19	1100	20.19	615	18.86	408	18.02	345	23.44	1200	25.60	1550	22.27	1490	21.44	885	16.69	193	17.44	269	23.73	1250	
30	24.27	1330	23.27	1110	20.11	605	18.77	394	18.02	345	23.44	1200	25.17	1480	24.44	1360	21.19	840	16.69	193	17.44	269	23.86	1270	
31	23.11	1150	20.11	605	18.77	394	18.02	345	23.44	1200	25.17	1480	24.11	1310	20.11	605	16.67	192	17.44	269	23.86	1270

Monthly Discharge of aux Sables River at Massey for year ending
September 30th, 1919

Drainage Area, 524 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,520	234	585	2.90	.45	1.12	1.29
November "	1,360	855	1,144	2.60	1.63	2.18	2.43
December "	1,190	605	840	2.27	1.15	1.60	1.84
January .. (1919)	575	394	489	1.10	.75	.93	1.07
February	394	272	321	.75	.52	.61	.64
March.....	1,200	289	623	2.29	.55	1.19	1.37
April	2,330	1,170	1,674	4.45	2.23	3.19	3.56
May.....	1,930	1,010	1,468	3.68	1.93	2.80	3.23
June.....	1,440	840	1,238	2.75	1.60	2.36	2.63
July.....	815	187	362	1.56	.36	.69	.80
August.....	313	192	228	.60	.37	.44	.51
September	1,270	242	546	2.42	.46	1.04	1.16
The year	2,330	187	793	4.45	.36	1.51	20.54

Blanche River near Englehart

Location—At the highway bridge near the High Falls, $3\frac{1}{2}$ miles south-west of the Town of Englehart, north half of lot 12, concession 3, Township of Evanurel, Timiskaming District.

Records Available—Discharge measurements from August, 1914. Gauge heights from October 8, 1914, with occasional omissions.

Drainage Area—430 square miles.

Gauge—Vertical steel staff 0-12 feet, located on the southeast downstream side of first pier. The zero of the gauge (elev. 8.00) is referred to B.M. elev. 23.39, painted on a conspicuous rock on the right bank 75 feet below the bridge.

Channel—At a point 200 feet above the station, the river curves from the right and then flows straight, up to a point 700 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay, practically permanent. The current is very slow, flowing through 2 channels at low stages and 3 channels during high water periods.

Discharge Measurements—Made from the highway bridge with a Price current meter.

Winter Flow—During the winter months measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Regulation—A temporary dam is built above the station during the summer months. This dam is used for storing water during the period when the river is used for log driving. The gauge heights at the section are, therefore, affected during the log driving periods.

Accuracy—Rating curve fairly well defined between gauge heights 10.50 feet and 12.00 feet.

Observer—W. D. Groom, Englehart.

Discharge Measurements of Blanche River near Englehart for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918 November 27.....	Taylor, J. R....	114	781	.86	12.70	675 (a)
1919 February 19.....	".....	45	209	.51	10.02	107 (b)
April 14.....	".....	116	1,125	1.85	15.44	2,079 (a)
June 3.....	".....	114	835	.66	13.02	555 (a)

(a) Logs below section.

(b) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Blanche River near Englehart for year ending September 30th, 1919

Date	October		November		December		January		February		March		April		May		June		July		August		September				
	Gauge Ht.	Discharge Ht.																									
	Peet Sec-ft.	Feet																									
1 13.25	820	14.00	760	14.00	1160	12.00	352	12.00	312	10.50	134	9.83	98	10.25	131	10.00	3350	13.08	13.46	905	10.42	186	9.33	113	11.46		
2 13.08	760	14.00	655	13.96	1140	12.00	352	12.17	346	10.50	134	9.83	98	10.25	131	10.33	3600	12.92	700	10.75	218	9.29	112	11.67			
3 12.79	655	13.83	1070	12.00	352	11.83	284	11.83	290	10.42	129	10.17	115	10.42	141	10.08	3410	13.33	670	10.92	239	9.21	108	11.62			
4 12.79	655	13.83	1070	12.00	352	11.83	284	11.83	290	10.42	129	10.17	115	10.17	115	10.25	3540	13.08	760	10.65	208	10.66	209	9.21			
5 12.79	655	13.83	1070	12.00	352	11.83	284	11.83	290	10.42	129	10.17	115	10.17	115	10.25	3550	13.21	805	10.63	207	9.42	118	11.75			
6 12.96	715	13.54	945	11.67	290	11.75	272	11.75	297	11.75	272	11.75	297	11.75	297	11.75	3558	24.47	17.00	3550	13.21	805	10.63	206	9.60		
7 13.67	1000	12.25	500	11.71	297	11.75	272	11.75	297	11.75	272	11.75	297	11.75	297	11.75	3550	13.21	790	10.62	204	9.50	122	13.42			
8	14.00	1160	12.67	620	11.42	226	11.42	226	11.42	226	11.42	226	11.42	226	11.42	226	11.42	3550	13.21	805	10.63	205	9.60	128	13.42		
9	13.75	1040	12.58	595	11.67	290	11.67	290	11.67	290	11.67	290	11.67	290	11.67	290	11.67	3550	13.21	805	10.63	205	9.60	128	13.42		
10	13.58	960	12.50	570	11.67	290	11.62	253	11.62	290	11.62	253	11.62	290	11.62	253	11.62	3550	13.21	805	10.63	205	9.60	128	13.42		
11	13.92	1120	12.50	570	11.67	290	11.62	253	11.62	290	11.62	253	11.62	290	11.62	253	11.62	3550	13.21	805	10.63	205	9.60	128	13.42		
12	13.92	1120	12.50	570	11.67	290	11.62	253	11.62	290	11.62	253	11.62	290	11.62	253	11.62	3550	13.21	805	10.63	205	9.60	128	13.42		
13	13.50	925	12.42	550	11.58	277	11.50	236	11.50	277	11.50	236	11.50	277	11.50	236	11.50	3550	13.21	805	10.63	205	9.60	128	13.42		
14	13.21	805	12.42	550	11.54	271	11.54	271	11.54	271	11.54	271	11.54	271	11.54	271	11.54	3550	13.21	805	10.63	205	9.60	128	13.42		
15	13.21	805	12.33	520	11.50	265	11.33	216	11.33	216	11.33	216	11.33	216	11.33	216	11.33	3550	13.21	805	10.63	205	9.60	128	13.42		
16	13.21	805	12.33	520	11.46	260	11.42	253	11.25	207	10.25	120	9.67	90	10.00	107	14.25	1300	10.00	2610	12.75	645	10.56	198	9.46		
17	13.37	870	12.46	560	11.42	253	11.25	207	10.25	120	9.67	90	10.00	107	14.25	1300	10.08	2610	12.75	645	10.56	198	9.46	120	15.04		
18	13.00	730	13.67	1000	1000	11.50	265	11.29	211	11.17	199	9.92	103	10.00	107	14.25	2140	10.29	2030	11.21	282	10.42	186	9.42	118	14.67	
19	13.37	870	13.83	1070	11.75	303	11.75	303	11.75	303	11.75	303	11.75	303	11.75	303	11.75	3550	13.21	805	10.63	205	9.60	128	13.42		
20	13.54	945	13.37	1120	12.17	386	11.25	207	10.17	115	9.67	90	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
21	13.21	805	12.33	520	11.46	260	11.42	253	11.25	207	10.17	115	9.67	90	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42		
22	13.08	760	13.92	1120	12.17	386	11.25	207	10.17	115	9.67	90	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
23	14.17	1260	13.58	960	1000	11.50	265	11.29	211	11.17	199	9.92	103	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33	
24	14.00	1160	13.25	820	12.00	352	11.42	141	9.75	94	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33				
25	15.75	2390	13.21	805	12.21	380	11.25	207	10.17	115	9.67	90	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
26	15.87	2480	12.83	610	12.00	352	11.25	207	10.17	115	9.67	90	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
27	15.67	2330	12.33	470	11.83	318	11.25	131	9.75	94	10.50	103	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
28	15.46	2170	12.33	470	11.17	220	10.58	153	10.42	129	10.42	129	10.42	129	10.42	129	10.42	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33
29	14.96	1780	10.00	1160	13.25	820	12.00	352	11.42	141	9.75	94	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
30	14.42	1410	10.00	1160	13.25	805	12.00	352	11.42	141	9.75	94	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		
31	14.42	1410	10.00	1160	13.25	805	12.00	352	11.42	141	9.75	94	10.00	107	14.25	3550	13.21	805	10.63	205	9.60	128	13.42	399	9.33		

Note.—Logs on control affect accuracy of estimates.

Monthly Discharge of Blanche River near Englehart for year ending
September 30th, 1919

Drainage Area, 430 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October...(1918)	2,480	655	1,157	5.77	1.52	2.69	3.10
November "	1,160	470	758	2.70	1.09	1.76	1.96
December "	386	220	306	.90	.51	.71	.82
January .. (1919)	346	131	226	.80	.30	.53	.61
February	134	94	116	.31	.22	.27	.28
March.....	134	90	105	.31	.21	.24	.28
April	3,870	131	2,239	9.00	.30	5.21	5.81
May	3,760	1,160	2,836	8.74	2.70	6.60	7.61
June	905	209	451	2.10	.49	1.05	1.17
July	239	106	178	.56	.25	.41	.47
August	300	108	141	.70	.25	.33	.38
September	2,000	324	885	4.65	.75	2.06	2.30
The year	3,870	90	785	9.00	.21	1.83	24.79

Frederickhouse River at Frederickhouse

Location—On the upstream side of the highway bridge crossing the river on the township line between the Townships of Fournier and Clute, District of Temiskaming.

Records Available—Discharge measurements and daily gauge heights from July, 1915, to September 30, 1917, were taken at the railway crossing 1.8 miles north and downstream from the present point of observation and measurement.

Drainage Area—1,260 square miles.

Gauge—Standard enamelled gauge plates 0.12 feet on the upstream side of the first pier from the left bank. Zero of the gauge is at an assumed elevation of 98.00 feet referred to a B.M. elev. 115.18, the top of an iron cap projecting above the floor of the bridge west of the west pier.

Channel and Control—The current is slow, but even across the section, and through one channel, away from the bridge, where discharge measurements are made when possible. Otherwise measurements are made from the bridge that breaks the flow into several channels.

Discharge Measurements—Made by current meter from the bridge, ice, or boat.

Regulation—There is no artificial control of the waters of this river above the section.

Accuracy—Logging operations have hampered metering during past year, and will more so in future.

Observer—T. Bourassa, Frederickhouse.

Discharge Measurements of Frederickhouse River at Frederickhouse for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 28.....	Taylor, J. R.....	100	813	.64	100.90	620 (a)
Feb. 21.....	"	170	937	.50	100.46	470 (b)
April 11.....	"	162	958	.57	100.77	546(b)
June 4.....	"	166	1,942	1.92	106.50	3,729 (c)
July 16.....	"	135	873	.42	99.65	364 (c)

(a) Ice measurement, section partly blocked by pulpwood and logs.

(b) Ice measurement.

(c) Log jam above section.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Frederickhouse River at Frederickhouse for year ending
September 30th, 1919

No.	October		November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht., Feet	Dis-charge Ht., Sec.-ft.																								
11	104.33	3070	104.67	3400	103.92	2610	102.17	1300	100.92	695	100.42	456	100.33	429	105.92	4690	101.33	6240	100.25	525	98.67	213	102.83	1860		
12	104.83	3560	104.42	3150	103.75	2480	102.00	1210	100.83	655	100.50	480	100.17	388	105.92	4690	107.08	5960	100.25	525	98.67	213	102.75	1800		
13	105.08	3800	104.17	2920	103.67	2410	102.08	1250	100.83	655	100.50	480	100.08	366	106.50	5320	106.67	5510	100.08	474	98.83	228	102.67	1740		
14	105.33	4070	104.00	2760	103.67	2410	102.08	1250	100.92	695	100.50	480	100.00	350	107.50	6420	106.33	5140	99.92	426	98.75	220	102.58	1680		
15	105.50	4240	103.93	2700	103.50	2280	102.17	1300	100.92	695	100.58	505	100.00	350	107.25	6150	106.1	4960	99.83	402	98.83	228	102.50	1630		
16	105.50	4240	103.83	2620	103.50	2280	102.08	1250	100.92	695	100.58	505	100.17	388	107.50	6420	105.67	4420	99.75	382	98.83	228	102.50	1630		
17	105.58	4330	103.83	2620	103.42	2220	102.08	1250	100.92	695	100.67	530	100.17	388	107.75	6700	105.42	4160	99.83	402	98.83	228	103.00	1980		
8	105.75	4510	103.92	2690	103.33	2150	102.00	1210	100.92	695	100.75	560	100.50	480	107.75	6700	105.25	3980	99.75	382	98.92	237	103.58	2420		
9	105.67	4420	104.00	2760	103.25	2090	102.00	1210	100.92	695	100.75	560	100.92	6150	105.67	6610	105.00	3980	99.75	382	98.92	237	104.08	2830		
10	105.42	4160	103.83	2620	103.25	2090	101.75	1080	100.83	655	100.83	585	101.25	745	107.75	6700	105.00	3720	99.75	382	99.00	245	104.42	3150		
11	105.42	4160	103.67	2490	103.17	2030	101.67	1040	100.83	655	100.83	585	101.57	885	107.75	6700	104.67	3400	99.83	402	99.00	245	105.08	3800		
12	105.33	4070	103.67	2490	103.00	1900	101.50	950	100.83	655	100.75	560	101.67	935	107.75	6700	104.58	3310	99.75	382	99.00	245	105.75	4510		
13	105.08	3800	103.58	2420	103.00	1900	101.42	910	100.83	655	100.75	560	101.83	820	107.75	6700	104.33	3070	99.83	402	98.92	237	105.42	4160		
14	104.83	3560	103.50	2360	102.75	1660	101.33	870	100.75	630	100.67	530	102.08	1370	107.67	6610	104.25	3160	98.75	382	98.83	228	104.92	3640		
15	104.67	3400	103.42	2290	102.75	1610	101.17	795	100.75	630	100.67	530	102.50	1630	107.58	6510	104.00	2760	99.67	364	98.75	220	104.92	3640		
16	104.42	3150	103.33	2220	102.42	1450	101.17	795	100.67	600	100.58	505	103.00	1980	107.50	6420	103.75	2560	99.58	346	98.67	213	104.92	3640		
17	104.25	2990	103.67	2490	102.17	1300	101.00	725	100.67	600	100.58	505	103.50	2360	107.42	6340	103.42	2290	99.33	296	98.67	213	104.92	3640		
18	104.10	2830	101.42	2830	101.42	1170	101.00	725	100.58	535	100.50	480	104.08	2830	107.42	6340	103.17	2090	99.08	257	98.67	213	104.75	3480		
19	104.08	2830	104.75	3400	101.75	2360	102.75	1660	101.33	870	100.50	480	104.58	3310	107.33	6240	102.50	1630	99.08	257	99.00	245	104.58	3310		
20	104.00	2760	104.67	3400	101.50	950	101.00	725	100.50	510	100.50	480	104.92	3640	107.42	6340	102.17	1420	99.00	245	99.08	257	104.75	3480		
21	104.00	2760	104.42	3150	101.42	910	100.92	695	100.50	510	100.50	480	105.33	4070	107.50	6420	101.50	1050	98.83	228	99.17	270	104.83	3560		
22	104.00	2760	104.33	3070	101.50	950	100.92	655	100.50	510	100.50	480	105.75	4510	107.75	6700	101.42	1010	98.75	220	99.42	314	104.92	3640		
23	103.92	2690	104.33	3070	101.50	950	100.83	655	100.50	510	100.50	480	105.75	4510	108.25	7250	101.25	925	98.53	206	100.17	501	105.08	3800		
24	104.17	2920	104.25	2920	101.50	950	101.00	725	100.50	510	100.50	480	105.75	4510	108.58	7610	101.08	845	98.50	200	100.67	675	105.17	3900		
25	104.58	3310	104.00	2680	101.75	1080	100.83	655	100.50	510	100.50	480	105.75	4510	108.42	7440	101.00	810	98.75	220	101.08	845	105.33	4070		
26	105.33	4070	104.00	2680	102.17	1300	101.00	725	100.50	510	100.50	480	105.75	4510	108.55	7690	100.58	640	98.92	237	101.42	1010	105.42	4160		
27	105.42	4240	104.08	2740	102.25	1300	101.00	725	100.50	510	100.50	480	105.83	4590	107.83	6790	100.50	610	98.92	237	102.42	1580	104.75	3480		
28	105.50	4240	104.08	2680	102.25	1350	101.00	725	100.42	456	100.50	480	105.83	4590	107.75	6700	100.50	610	98.92	237	102.42	1580	104.75	3480		
29	105.25	3980	104.00	2680	102.17	1300	101.00	725	100.83	655	100.33	429	100.50	480	105.83	4590	107.67	6610	100.33	550	98.83	228	102.75	1800	104.67	3400
30	105.00	3720	104.00	2680	102.17	1300	101.00	725	100.92	695	100.33	429	100.50	480	105.83	4590	107.67	6610	100.33	550	98.75	220	102.92	1920	104.67	3400
31	105.00	3720	104.00	2680	102.17	1300	101.00	725	100.92	695	100.33	429	100.50	480	105.83	4590	107.67	6610	100.33	550	98.75	220	102.92	1920	104.67	3400

Monthly Discharge of Frederickhouse River at Frederickhouse
for year ending September 30th, 1919

Drainage Area, 1,260 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	4,510	2,690	3,608	3.58	2.13	2.86	3.30
November "	3,400	2,220	2,759	2.70	1.76	2.19	2.44
December "	2,610	910	1,630	2.07	.72	1.29	1.49
January .. (1919)	1,300	655	902	1.03	.52	.72	.83
February	695	456	600	.55	.36	.48	.50
March	585	429	500	.46	.34	.40	.46
April	4,590	350	2,312	3.64	.28	1.83	2.04
May	7,610	4,690	6,499	6.04	3.72	5.16	5.95
June	6,240	550	2,712	4.95	.44	2.15	2.40
July	525	200	326	.42	.16	.26	.30
August	1,920	213	512	1.52	.17	.41	.47
September	4,510	1,630	3,174	3.58	1.29	2.52	2.81
The year	7,610	200	2,134	6.04	.16	1.69	23.00

Kapuskasing River at Kapuskasing

Location—About 500 feet downstream from the C. G. Railway's bridge, and 300 feet upstream from the C.N. Ry.'s pump-house in the Village of Kapuskasing.

Records Available—Discharge measurement from March 23rd, 1918, gauge heights from May 10th, 1918.

Drainage Area—2,820 square miles.

Gauge—A chain gauge consisting of weight held by chain, and four plates of H.E.P.C. standard gauge, has been installed. The gauge is located 75 feet upstream from the section. The initial point for soundings is a track spike driven in a 16-inch cedar tree on the north bank.

Channel and Control—The channel is straight for 300 feet above and below the section. A small island exists at low water 75 feet below the section. The banks are high, rocky, slightly wooded, and are not liable to overflow. The bed of the river consists of clean rock and is permanent.

Discharge Measurements—Made from a boat with a small Price current meter.

Winter Flow—The rating curve is affected by ice and measurements are taken to determine the flow.

Observer—J. Ferguson, Kapuskasing, Ontario.

Discharge Measurements of Kapuskasing River at Kapuskasing for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 29.....	Taylor, J. R....	306	1,450	.76	676.40	1,110 (a)
Feb. 23.....	".....	306	1,249	.63	676.02	792 (a)
April 13.....	".....	312	2,194	1.35	678.30	2,958 (a)
May 29.....	".....	319	3,415	2.37	681.83	8,070
July 18.....	".....	302	1,462	.55	675.55	806
Aug. 27.....	".....	304	1,734	.86	676.42	1,493

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second feet of Kapuskasing River at Kapuskasing for year
ending September 30th, 1919

September											
August						July					
June			May			April			March		
October	November		December	January		February		March		April	
Gauge Ht.	Gauge Ht.		Gauge Ht.	Gauge Ht.		Gauge Ht.	Gauge Ht.		Gauge Ht.	Gauge Ht.	
Sec.-ft.	Sec.-ft.		Sec.-ft.	Sec.-ft.		Sec.-ft.	Sec.-ft.		Sec.-ft.	Sec.-ft.	
1 677.69	2650 678.49		3610 678.28	3010 676.20		910 676.53	930 676.53		700 675.59	615 680.90	
2 677.65	2600 678.42		3520 678.23	2940 676.21		915 676.21	940 675.75		695 675.58	610 681.66	
3 677.57	2520 678.23		3300 678.32	3440 676.21		916 676.21	915 675.82		670 675.52	630 682.27	
4 677.52	2460 678.15		3200 678.26	2570 676.23		930 676.20	910 675.86		705 675.64	640 682.38	
5 677.40	2330 677.90		2900 678.09	2770 676.23		930 676.19	905 675.88		770 675.67	655 682.17	
6 677.34	2260 677.90		2900 677.92	2570 676.23		930 676.16	880 675.92		790 675.67	655 682.00	
7 677.32	2240 677.98		3000 677.78	2420 676.23		930 676.16	875 675.93		800 675.73	685 681.92	
8 677.24	2160 678.07		3100 677.78	2420 676.23		930 676.11	845 675.94		805 675.89	755 681.92	
9 677.15	2070 678.23		3300 677.73	2360 676.27		960 676.10	840 675.92		790 675.99	835 681.86	
10 677.23	2150 678.23		3400 677.69	2320 676.28		965 676.09	835 675.92		790 676.08	895 681.80	
11 677.28	2200 678.40		3500 677.86	2510 676.29		965 676.06	815 675.90		780 676.65	1220 681.73	
12 677.27	2190 678.52		3640 677.69	2320 676.31		985 676.04	805 675.88		770 677.46	820 678.63	
13 677.48	2420 678.27		3340 677.42	240 676.34		1010 676.02	790 675.88		770 675.88	8130 681.69	
14 677.74	2710 678.17		3220 677.34	1960 676.34		1010 675.86	700 675.94		805 678.66	3090 681.61	
15 677.79	2610 677.25		1870 676.38	1040 675.83		685 675.90	780 679.02		3880 681.42	760 679.50	
16 677.80	2780 677.19		2900 677.19	1810 676.42		1060 675.96	755 675.80		720 679.50	4460 681.32	
17 677.75	2720 677.98		3000 677.11	1730 676.56		1120 675.95	755 675.80		720 680.50	5120 681.15	
18 677.82	2800 678.92		4120 677.00	1630 676.53		1140 675.97	760 675.79		715 680.69	6080 680.92	
19 677.90	2900 679.38		5500 676.90	1540 676.54		1150 675.99	775 675.76		700 681.11	670 680.73	
20 677.94	2950 680.30		5950 676.84	1490 676.54		1150 676.00	765 676.46		681 30	700 680.59	
21 677.94	2850 680.19		5380 676.88	1200 676.53		1140 676.02	790 675.71		675 46	760 675.46	
22 677.80	2750 679.78		4820 676.80	1450 676.54		1150 676.03	800 675.63		635 81.86	7910 680.74	
23 677.69	2650 679.55		4520 676.66	1320 676.50		1120 676.02	790 675.63		635 682.50	9650 681.28	
24 677.59	2500 679.49		4340 676.57	1020 676.48		1110 676.00	770 675.67		610 682.38	9420 682.13	
25 677.57	2520 678.17		4060 676.51	1210 676.46		1090 676.00	770 675.67		682.11	810 682.75	
26 677.52	2460 678.82		3640 676.46	1170 676.42		1050 676.00	750 675.60		600 681.65	8060 682.62	
27 677.42	2550 678.86		3460 676.38	1110 676.36		1020 676.00	730 675.57		605 681.46	7740 682.13	
28 677.35	2520 678.82		3200 678.34	1080 676.36		1020 676.00	700 675.57		644 46	1400 675.42	
29 677.28	2880 678.88		3370 678.59	1030 676.34		1050 676.00	670 675.57		615 681.23	7370 682.11	
30 678.17	3220 678.48		3240 676.22	995 676.40		1050 676.00	665 675.57		605 681.00	700 681.59	
31 678.34	3430 678.34		975 676.23	675.59		615 680.80	615 681.19		6690 681.19	7300 676.12	
				675.59		930 676.23	675.59		680.77	680.77	

**Monthly Discharge of Kapuskasing River at Kapuskasing for year ending
September 30th, 1919**

Drainage Area, 2,820 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ..(1918).	3,430	2,070	2,586	1.22	.73	.92	1.06
November ..	5,950	2,900	3,709	2.11	1.03	1.32	1.47
December ..	3,040	975	1,898	1.08	.35	.67	.77
January ..(1919).	1,150	910	1,022	.41	.32	.36	.42
February	940	685	808	.33	.24	.29	.30
March.....	805	600	706	.29	.21	.25	.29
April	9,650	610	4,349	3.42	.22	1.54	1.72
May.....	10,150	6,220	8,019	3.60	2.21	2.84	3.27
June	6,120	1,140	3,008	2.18	.40	1.07	1.19
July.....	1,100	595	755	.39	.21	.27	.31
August	1,530	495	768	.54	.18	.27	.31
September.....	4,750	950	2,749	1.68	.34	.97	1.08
The year	10,150	495	2,535	3.60	.18	.90	12.20

Mattagami River at Smooth Rock Falls

Location—Lot 23, concession XI, Township of Kendry, Timiskaming District. About one mile below the plant of the Mattagami Pulp and Paper Co. at Smooth Rock Falls.

Records Available—The Mattagami Pulp and Paper Co. take readings of the water below their plant, from which it is expected estimates of flow may be made when a curve is defined.

Drainage Area—3,970 square miles.

Gauge—A chain gauge is installed reading zero with the elevation of the water at 707.00, referred to a B.M. elev. 725.04. The B.M. is 10 feet S.W. of the initial point for soundings the head of a nail driven in a blazed and painted tree.

Channel and Control—A well-defined, evenly distributed current exists at all times. There is but one channel at all stages. Extreme high water is not likely to go over the river banks at this spot. The control point is not well defined, or as yet has not been ascertained.

Regulation—Extensive storage works have been constructed for the purposes of regulating the headwaters of the river for the benefit of power plants.

Discharge Measurements—Made by current meter from a boat or the ice.

Winter Flow—The amount of ice effect on discharge is not yet determined, but will be considerable.

Discharge Measurements of Mattagami River at Smooth Rock Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
February 22.....	Taylor. J. R....	409	3,611	.61	710.65	2,188 (a)
June 5.....	.. ....	399	4,441	1.38	712.78	6,130
July 24.....	.. ....	385	3,224	.58	709.20	1,879

(a) Ice measurement.

Mississagi River at Iron Bridge

Location—At highway bridge in the village of Iron Bridge, south half of lot 3, concession 2, Township of Gladstone, District of Algoma.

Records Available—Discharge measurements from September, 1915. Daily gauge heights from November 16, 1915, to October 1st, 1919.

Drainage Area—3,565 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches, 0 to 6 foot section placed on pile on left shore 350 feet down stream from bridge, 6 to 12 foot section placed on down stream side of right abutment of bridge. Zero of the gauge (elev. 30.00) referred to bench mark (elev. 55.50 feet) on top of right abutment down stream side.

Channel—Straight for about 300 feet above and about 1 mile below the gauging station. The bed of the stream consists of clay and sand, slightly shifting.

Discharge Measurements—Made from highway bridge with small Price current meter.

Control—About eleven miles below the gauging station there is a small falls and rapids known as the Mississagi rapids. Log jams sometimes occur on these rapids during low water period, which may cause back water at the gauging station.

Winter Flow—During the winter months measurements are made through the ice to determine the winter flow. The relation of gauge height to discharge is seriously affected by ice.

Accuracy—There is a slight back flow at the west end of the section during low stages.

Observer—Nelson Warnock, Iron Bridge.

Discharge Measurements of Mississagi River at Iron Bridge for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 23.....	Taylor, J. R....	178	2,835	1.43	33.75	4,048
November 28.....	Loy, R.....	182	3,466	2.53	37.33	8,761
December 21.....	Taylor, J. R....	180	3,049	1.50	34.87	4,587 (a)
1919						
February 27.....	".....	235	2,512	.69	32.83	1,735 (a)
March 18.....	".....	227	2,630	.78	33.58	2,067 (a)
April 23.....	".....	193	4,821	3.19	43.81	15,391

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second feet of Mississagi River at Iron Bridge for year ending September 30th, 1919

Oct.	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	32.00	2550	36.67	7750	36.25	7020	36.50	6400	33.67	2850	32.96	1960	33.83	4120	39.92	12430	36.08	6940	34.08	4920	30.92	1450	31.04	1450
2	31.92	2460	36.42	7450	36.21	6980	36.50	6400	33.62	2790	33.00	2000	33.83	4120	40.33	13270	35.92	6400	33.54	4000	30.87	1390	31.00	1390
3	31.87	2410	36.12	7100	36.08	6830	36.50	6400	33.54	2700	33.04	2040	33.47	3730	40.54	13730	35.83	6280	33.25	5050	30.83	1390	30.96	1390
4	31.83	2360	35.83	6770	36.00	6740	36.25	6120	33.67	2850	33.04	2040	33.17	3620	40.62	13900	35.62	6280	33.00	3160	30.79	1390	30.92	1390
5	32.08	2640	35.54	6440	35.83	6320	36.00	5858	33.67	2850	33.08	2090	33.33	3790	40.54	13750	35.29	5780	32.79	3060	30.75	1320	30.83	1320
6	32.62	3230	35.33	6210	37.00	7660	36.08	5940	33.54	2700	33.00	2000	35.00	5630	40.50	13750	34.92	5050	32.83	3060	30.71	1260	30.81	1320
7	33.00	3650	35.25	6120	37.92	8780	36.25	6120	33.50	2660	33.00	2000	36.08	6830	40.50	13640	35.58	5640	32.83	3460	30.67	1260	30.75	1320
8	33.58	4290	35.46	6360	37.75	8570	36.21	6080	33.46	2620	33.00	2000	36.00	6960	40.17	12930	35.92	6160	32.75	2860	30.60	1200	30.75	1320
9	33.83	4560	35.96	6920	37.29	8010	36.00	5850	33.50	2430	33.00	2000	35.92	6870	39.83	12260	36.25	6800	32.58	2850	30.54	1140	30.73	1320
10	33.92	4660	36.17	7160	37.08	7760	36.58	6490	33.17	2300	32.96	1960	36.33	7340	39.50	11670	36.79	7620	32.37	2780	30.48	1080	30.73	1260
11	33.83	4560	36.12	7210	37.50	8020	35.50	5080	33.17	2300	32.92	1910	40.25	13100	39.25	10700	36.83	8040	32.29	2590	30.48	1140	30.73	1200
12	33.75	4480	36.12	7100	37.75	8320	35.29	4850	33.23	2360	32.92	1910	41.50	16000	38.75	10250	36.67	8020	32.21	2410	30.46	1080	30.71	1200
13	33.83	4560	36.08	7060	37.37	7870	35.25	4800	33.29	2300	32.87	1860	42.00	17220	38.33	9520	36.33	7870	32.12	2410	30.46	1080	30.71	1140
14	33.83	4560	36.00	6960	37.08	7520	35.25	4800	33.31	2450	32.79	1770	42.25	17830	38.00	9070	36.50	7280	32.00	2330	30.46	1140	31.08	1320
15	33.75	4480	35.79	6720	36.42	6550	35.27	4830	33.25	2380	32.79	1770	41.83	16800	37.75	8760	36.50	7680	31.92	2330	30.62	1140	31.19	1320
16	33.67	4390	35.67	6590	36.21	6300	35.08	4620	33.17	2300	33.04	2040	41.33	15580	37.42	8330	36.50	7960	31.83	2080	30.71	1140	31.17	1590
17	33.58	4290	36.00	6960	35.75	5800	35.00	5350	33.08	2200	33.00	2000	41.08	14970	37.92	8620	36.29	7800	31.75	2010	30.75	1200	31.17	1510
18	33.50	4200	36.92	8050	35.58	5610	34.92	4440	33.06	2180	33.58	2640	40.83	14370	38.75	9660	35.92	7200	31.71	1930	30.73	1260	31.12	1450
19	33.58	4290	38.04	9450	35.17	5160	34.92	4440	33.00	2110	33.83	3460	40.75	14190	39.08	10700	35.67	6800	31.58	1930	30.75	1260	31.04	1510
20	33.67	4390	39.33	11380	35.08	4840	34.67	4170	33.00	2110	34.08	3740	41.17	15190	39.42	11010	35.50	7070	31.58	1930	30.81	1200	31.00	1450
21	33.67	4480	39.67	4810	34.62	4110	33.00	2110	34.33	4010	34.29	3970	43.83	21700	39.17	11010	34.83	6300	31.62	1790	30.84	1260	31.08	1510
22	33.75	4480	39.54	11740	35.17	4940	34.54	4020	33.00	2110	34.29	3970	43.83	21700	39.17	10700	34.92	5400	31.67	1930	31.08	1450	33.00	1630
23	33.73	4450	39.25	11250	35.50	5300	34.50	3980	33.00	2110	34.29	3970	43.83	21700	39.00	10700	34.92	5400	31.58	2010	30.92	1260	31.83	1750
24	33.74	4520	38.83	10600	35.25	5020	34.33	3790	32.96	2070	34.29	3970	44.00	22120	38.79	10250	35.00	6160	31.54	1930	30.87	1320	32.12	2030
25	34.58	5390	38.50	10100	36.25	6200	34.12	5360	32.96	2070	34.42	4110	43.75	21510	38.42	9800	35.08	5900	31.46	1860	31.00	1320	32.58	2330
26	35.50	6400	38.08	9500	37.17	6160	34.14	3580	32.96	2070	34.58	4230	43.00	19670	37.92	5780	31.37	1790	31.08	1450	33.00	2570		
27	35.75	6680	37.62	8910	37.37	7390	34.14	3580	32.83	1810	34.83	4890	43.00	17220	37.67	8620	34.67	5400	31.08	1710	31.08	1510	33.33	3000
28	36.42	7450	37.33	8550	37.37	7390	34.06	3500	32.87	1860	34.75	4800	41.46	15900	37.33	8330	34.58	5400	31.08	1650	31.04	1450	33.33	3180
29	37.08	8140	36.92	7930	37.48	7520	34.04	3470	33.62	4660	41.00	14770	37.08	7900	34.67	5270	31.08	1510	31.00	1450	33.58	3160		
30	37.00	8140	36.67	6760	37.00	6960	33.92	3340	33.46	4490	40.58	13820	36.71	7620	34.50	5160	31.00	1450	33.92	3260	31.00	1390	31.00	1390
31	36.92	8050	36.00	.....	.....	6590	33.87	3290	33.66	4070	33.00	.....	34.08	34.08	36.33	6800	31.00	1450	31.00	1390	31.00	1390	31.00	1390

Note.—Flow estimates from May 11th, based on flow at O'Neil's Farm Section.

Monthly Discharge of Mississagi River at Iron Bridge for year ending
September 30th, 1919

Drainage Area, 3,565 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	8,240	2,360	4,687	2.31	.66	1.31	1.51
November "	11,970	6,120	8,131	3.36	1.71	2.28	2.54
December "	8,780	4,610	6,763	2.46	1.29	1.88	2.17
January (1919)	6,490	3,290	4,788	1.82	.92	1.34	1.54
February.....	2,850	1,810	2,349	.80	.51	.66	.69
March.....	4,890	1,770	2,938	1.37	.50	.82	.94
April.....	22,120	3,620	13,238	6.20	1.02	3.71	4.14
May.....	13,900	6,800	10,618	3.90	1.91	2.98	3.44
June.....	8,040	5,050	6,545	2.26	1.42	1.84	2.05
July.....	5,050	1,450	2,459	1.42	.41	.69	.80
August.....	1,450	1,080	1,281	.41	.30	.36	.42
September.....	3,260	1,140	1,720	.91	.32	.48	.54
The year.	22,120	1,080	5,464	6.20	.30	1.53	20.81

Mississagi River at O'Neil's Farm

Location—Near lot 6, Township of Thompson, District of Algoma, 3½ miles downstream from Iron Bridge and 1½ miles above the steel bridge at Mississagi P.O.

Records Available—Discharge measurements from May, 1919, and daily gauge readings from May 11th, 1919.

Drainage Area—3,640 square miles.

Gauge—Chain gauge consisting of chain and four plates of standard gauge plating, reading 0-12 ft. Gauge zero, elev. 85.00, referred to B.M., elev. 100.00, consisting of three 6" spikes driven into root of blazed elm tree.

Channel—Straight for 100 feet above and about one mile below widening out about 300 feet below section. Both banks are wooded. There is one channel at ordinary stages and two channels at extreme high water.

Discharge Measurements—Made from boat with small Price current meter.

Control—There is considerable log driving done on this river and a jam below the section would affect the discharge.

Winter Flow—There will likely be some ice effect as the section will partly freeze over.

Observer—Sam. O'Neil, Dean Lake.

Discharge Measurements of Mississagi River at O'Neil's Farm for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
May 9.....	Taylor, J. R.	240	4,208	2.91	93.17	12,231
June 17.....	"	236	3,340	1.63	90.48	5,463
July 29.....	Loy, R	220	2,487	.52	85.83	1,292
Sept. 29.....	Taylor, J. R.	228	2,694	1.34	87.50	3,612

Daily Gauge Height in feet of Mississagi River at O'Neil's Farm for year ending September 30th, 1919

South River at Cox's Chute

Location—150 feet above the last of Cox's Chutes, four miles west of the Town of Trout Creek, near Lot 35, Concession 2, Township of Himsworth, District of Parry Sound.

Records Available—Discharge measurements from December, 1918, and daily gauge readings from December 5th, 1918.

Drainage Area—166 square miles.

Gauge—Chain gauge installed on right bank directly above section. Zero=92.86 referred to a B.M. assumed elevation 100.00 on 4" spruce tree.

Channel and Control—Channel above station straight for about 60 feet widening out into large pool. Below station straight to head of falls, there dividing into two channels. Water swift at all times. Right bank is high and left bank is low but not liable to overflow. Both banks are wooded; logs may jam at falls below section and affect discharge.

Discharge Measurements—Made from bridge with small Price Current meter suspended by cable.

Winter Flow—Ice conditions will affect the relation of gauge height to discharge.

Observer—W. Freeman, Trout Creek.

Discharge Measurements of South River at Cox's Chute for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Fect
1919						
February 13	Taylor, J. R.....	20	48	2.41	93.86	115
March 31	"	33	108	4.78	96.00	515
July 10	"	21	42	1.83	93.42	78
September 23	"	20	46	1.99	93.68	92

Daily Gauge Height in feet of South River at Cox's Chute for year ending September 30th, 1919

NOTE.—February 14th, change in location of gauge.

South River near Powassan

Location—75 feet below "Gough's" highway bridge on the Nipissing village road 2.5 miles northwest of Powassan station and at the farm owned by Owen Gough between lots 20 and 21 and 14th and 15th concessions in the Township of Hinsworth, in the District of Parry Sound.

Records Available—Discharge measurements from July 6, 1917, and before then at "Healey's" bridge. Daily gauge heights from March 11, 1914.

Drainage Area—294 square miles.

Gauge—Standard enamelled gauge plates 0.12 feet on the northwest corner of the left abutment. Elevation of the zero of the gauge 22.76 feet is referred to a B.M. elevation assumed 56.15 feet painted on the top of a corner of barn foundation 350 feet from the section.

Channel—Straight for about 200 feet above and 150 feet below the metering section. With high water conditions both banks are liable to overflow. The bed is largely composed of soft, black muck, likely to shift under high velocities.

Discharge Measurements—Made with current meter from a boat at a section 100 feet below the bridge.

Winter Flow—Measurements made through ice in the winter. Ordinary relations between gauge heights and discharge are seriously disturbed by ice conditions, and measurements are made in the winter to determine this effect.

Accuracy—A fairly well defined rating curve has been established.

Observer—Owen Gough, Powassan.

Discharge Measurements of South River near Powassan for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 11.....	Taylor, J. R....	100	578	.76	26.05	437
November 26.....	Loy, R. P	90	580	.80	26.01	461
December 31.....	"	90	531	.78	25.93	412 (a)
1919						
February 15.....	Taylor, J. R....	73	349	.48	24.68	169 (a)
March 12.....	Loy, R. P	78	350	.49	24.47	171 (a)
May 28.....	"	94	756	1.22	28.34	919
July 11.....	Taylor, J. R....	81	407	.20	23.84	80
September 23.....	"	87	464	.42	24.79	197

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of South River near Powassan for year ending September 30th, 1919

Oct	November	December	January	February		March		April		May		June		July		August		September		
				Gauge Ht.	Discharge Sec-ft.															
				Feet	Sec-ft.															
1	25.34	283	26.26	475	26.05	427	25.76	365	25.09	226	24.55	152	27.47	800	27.93	925	27.22	730	23.93	91
2	25.01	229	25.80	373	26.22	466	25.68	349	25.01	214	24.59	157	27.38	775	28.26	1020	26.93	650	23.76	75
3	25.76	365	25.51	315	26.05	427	25.68	349	25.01	214	24.59	157	27.00	690	28.68	1140	26.68	585	23.84	86
4	25.76	365	26.26	475	26.09	436	25.59	331	24.97	208	24.59	157	26.93	650	28.47	1080	26.47	530	23.88	86
5	25.05	235	26.43	520	25.84	381	25.43	300	24.93	202	24.59	157	27.09	690	28.13	985	26.22	466	23.84	83
6	28.17	995	26.30	485	25.76	365	25.43	300	24.84	190	24.59	157	27.55	820	27.84	900	26.34	595	23.93	91
7	27.76	880	26.22	466	25.65	305	25.76	365	25.43	300	24.84	190	24.51	146	28.26	1020	27.68	855	26.93	650
8	26.84	625	26.38	505	25.76	365	25.43	300	24.84	190	24.43	136	28.09	970	27.59	830	27.30	750	23.97	95
9	26.46	525	27.93	925	25.76	365	25.38	290	24.76	179	24.43	136	27.80	890	27.58	775	27.80	890	23.88	86
10	26.30	485	28.54	1100	25.68	349	25.26	253	24.68	168	24.43	136	28.09	970	27.13	705	27.34	760	23.84	83
11	26.05	427	27.80	890	25.51	315	25.26	253	24.68	168	24.43	136	28.47	1080	26.97	660	26.72	595	23.84	91
12	26.05	427	27.38	775	25.51	315	25.26	253	24.59	157	24.43	136	29.72	1430	26.98	635	26.13	528	23.84	83
13	26.76	605	27.13	705	25.51	315	25.26	253	24.59	157	24.51	146	29.38	1330	26.73	595	26.05	427	23.76	75
14	26.88	635	26.84	625	25.55	323	25.26	253	24.51	146	24.43	136	28.97	1220	26.55	550	25.63	339	23.76	75
15	26.33	570	26.63	570	25.93	401	25.18	240	24.59	157	24.43	136	28.65	1130	26.43	520	25.55	323	23.88	86
16	26.38	505	26.43	505	25.88	390	25.18	240	24.59	157	24.43	136	28.43	1070	26.34	495	25.38	290	23.76	75
17	26.18	456	26.22	466	25.72	357	25.09	226	24.59	157	24.59	157	26.80	615	29.05	1240	26.34	495	25.38	290
18	26.51	540	26.30	485	25.59	331	25.09	226	24.59	157	24.51	146	29.43	1350	29.38	1330	26.68	585	25.09	245
19	26.19	550	26.55	550	25.43	300	25.09	226	24.51	146	28.59	1110	29.22	1290	26.84	625	25.05	235	23.72	72
20	26.34	495	26.93	650	25.43	300	25.01	214	24.44	137	29.05	1240	30.05	1520	26.63	570	24.97	222	23.68	68
21	26.51	540	26.59	560	25.34	283	25.01	214	24.48	142	29.47	1360	30.84	1740	27.18	715	24.59	170	23.72	72
22	26.55	550	26.43	520	26.59	560	25.01	214	24.59	157	28.93	1210	29.88	1470	28.47	1080	26.34	495	23.76	75
23	26.47	530	26.43	520	28.72	1150	25.05	220	24.59	157	28.34	1040	29.18	1280	30.05	1520	24.09	105	23.84	83
24	26.38	505	26.34	495	27.97	940	25.30	243	24.51	146	28.59	1110	28.97	1220	30.78	1720	24.01	99	23.80	79
25	26.50	535	26.26	475	27.26	740	25.47	271	24.51	146	28.59	1110	28.51	1090	29.34	1320	23.84	83	23.76	75
26	26.76	605	26.05	427	26.80	615	25.59	292	24.51	146	29.30	1310	28.26	1020	28.93	1210	23.84	83	23.72	72
27	26.76	605	25.97	409	26.47	530	25.47	271	24.51	146	30.47	1640	28.47	1080	28.59	1110	23.93	91	23.76	75
28	26.72	395	25.84	381	26.22	466	25.34	249	24.51	146	29.30	1450	28.55	1100	28.38	1050	23.93	91	23.84	83
29	26.88	635	26.18	456	26.09	436	25.26	237	24.51	146	29.34	1320	28.51	1090	28.09	1070	23.93	91	23.84	83
30	26.18	456	26.51	540	25.97	409	25.26	237	24.51	146	28.76	1160	28.18	890	27.80	995	23.93	91	23.84	83
31	25.93	401	25.93	401	25.18	224	25.18	224	24.51	146	28.05	960	27.51	810	27.51	810	23.80	79	24.26	127

Monthly Discharge of South River near Powassan for year ending
September. 30th, 1919

Drainage Area, 294 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	995	229	521	3.38	.78	1.77	2.04
November. "	1,100	315	555	3.74	1.07	1.89	2.11
December "	1,150	283	445	3.91	.96	1.51	1.74
January .. (1919)	365	214	264	1.24	.73	.90	1.04
February	226	137	168	.77	.47	.57	.59
March	1,640	136	652	5.58	.46	2.22	2.56
April.....	1,740	650	1,100	5.92	2.21	3.74	4.17
May.....	1,720	495	882	5.85	1.68	3.00	3.46
June.....	890	83	370	3.02	.28	1.26	1.41
July.....	95	68	82	.32	.23	.28	.32
August	269	75	127	.91	.26	.43	.50
September	290	68	124	.99	.23	.42	.47
The year.....	1,740	68	442	5.92	.23	1.50	20.40

Spanish River at Webbwood

Location—On the highway bridge about one mile east of Webbwood station on the Sault Branch of the C.P.R. and eight miles below Espanola Mills.

Records Available—Gauge readings daily from February 1, 1917. Discharge measurements monthly from January, 1917.

Drainage Area—4,340 square miles.

Gauge—Vertical steel staff gauge 0-12 feet on south side of 2nd pier from right bank. Zero, 36.00, referred to B.M. elev. 45.70, on south-east corner of 1st pier.

Channel—The approach to the bridge is straight for 300 feet above, and below the bridge for one-half mile.

Discharge Measurements—During the open water season the measurements are made from the bridge and boat. During the winter season the measurements are made from the ice under the bridge.

Winter Flow—The relation between gauge readings and discharge is seriously disturbed during the winter months.

Regulation—The Spanish River Pulp and Paper Co. operate a plant at Espanola, eight miles above the section, which is partly shut down on Sundays, accounting for the fluctuation in gauge heights at the week ends. This company also has storage dams at various locations on the headwaters of this river for conserving the flow for both lumber and power purposes.

Observer—D. J. Stewart, Webbwood.

Discharge Measurements of Spanish River at Webbwood for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 28.....	Taylor, J. R.....	202	2,962	.98	38.17	2,899 (a)
Mar. 17.....	" ..	197	2,896	1.18	38.45	3,423 (a)
May 1.....	" ..	275	5,600	2.98	45.21	16,698
July 28.....	Loy, R. P.	228	3,895	.81	38.37	3,171
Sept. 30.....	Taylor, J. R....	230	4,002	1.16	38.61	4,633

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Spanish River at Webbwood for year ending
September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September			
Gauge Ht. Sec.-ft.	Discharge Ht., Feet	Gauge Ht., Sec.-ft.	Discharge Ht., Feet																						
1 37.83	2650	41.58	9020	41.75	8560	40.17	5280	38.75	3060	39.00	3240	41.42	8700	45.25	17520	43.42	13130	38.58	3690	37.83	2650	38.50	3570		
2 37.75	2560	41.33	8520	41.58	8220	40.00	4990	37.67	2060	37.58	2010	40.17	6330	45.17	17330	43.75	13920	38.42	3450	37.75	2560	38.42	3450		
3 37.92	2760	41.00	7860	41.58	8220	39.75	4580	38.50	2730	38.25	2460	40.17	6330	45.00	16920	43.00	12150	38.42	3450	37.58	2400	38.42	3450		
4 38.00	2860	41.42	8700	41.50	8060	39.67	4450	38.42	2730	38.08	2330	39.75	5580	44.25	15120	42.50	11000	38.33	3320	38.25	3200	38.17	3090		
5 38.33	3200	40.83	7540	40.50	8060	39.08	3540	38.50	2730	38.00	2270	39.50	5160	44.33	15310	42.32	10820	38.33	3320	38.00	2860	38.00	2860		
6 37.42	2280	40.50	6920	41.25	7580	39.17	3680	38.50	2730	38.00	2270	39.67	5150	44.25	15120	42.42	83	37.83	2650	38.25	3200	37.67	2480	36.50	1790
7 38.17	3090	39.75	5580	41.00	7100	39.33	3920	38.33	2540	38.33	2550	42.50	11000	44.42	15530	42.83	11760	37.58	2400	37.67	2480	36.50	1790		
8 38.42	3450	40.33	6610	40.50	6200	39.42	4050	38.25	2460	38.50	2730	43.42	13130	44.75	16320	42.67	11390	37.67	2480	37.50	2340	37.75	2560		
9 38.25	3200	40.67	7230	40.92	6960	39.25	3800	36.67	1660	37.17	1820	43.92	14330	44.92	16730	42.25	10450	37.67	2480	37.33	2220	37.75	2560		
10 38.25	3200	40.08	6160	40.42	6060	39.17	3680	38.33	2540	38.25	2460	44.42	15530	44.92	16730	42.00	9900	37.75	2560	36.50	1790	37.58	2400		
11 38.33	3220	40.50	6920	40.67	6510	39.00	3420	38.00	2270	38.17	2400	46.25	19200	44.33	15310	41.75	9380	37.67	2480	36.83	1940	37.83	2650		
12 38.42	3450	40.33	6610	40.33	5890	38.33	2540	37.83	2160	38.17	2400	47.25	22320	44.92	16730	40.50	6920	37.75	2560	36.75	1900	37.50	2340		
13 38.42	2960	40.33	6610	40.25	5760	38.50	2730	37.67	2060	38.00	2270	....	....	44.83	16510	40.17	6330	37.17	2120	37.00	2020	37.42	2280
14 37.83	2650	40.00	6020	40.08	5470	38.58	2830	37.83	2160	38.00	2270	....	....	44.83	16510	40.00	6020	37.58	2400	37.33	2220	36.17	1680
15 37.67	2480	39.83	5720	40.58	6340	38.58	2830	37.83	2160	37.83	2160	....	....	44.17	14930	40.42	6780	37.75	2560	37.58	2400	37.83	2650
16 37.67	2480	39.25	4740	40.58	6340	38.50	2730	36.67	1660	36.65	1680	....	....	43.50	13220	40.75	7390	37.83	2650	37.67	1860	37.83	2650
17 37.58	2400	38.33	3220	40.42	6060	38.42	2630	38.17	2400	38.50	2730	47.83	23710	44.17	14330	40.42	6780	37.25	2560	36.33	1730	37.83	2650		
18 37.58	2400	41.08	8020	40.25	5760	38.25	2460	38.00	2270	39.00	3420	45.50	22290	45.92	19130	40.33	6610	37.58	2400	37.50	2340	38.00	2860		
19 37.42	2280	43.17	12540	40.33	5890	36.67	1660	38.17	2400	39.33	3920	47.33	22510	45.50	18120	40.42	6780	37.25	2170	37.08	2070	37.67	2480		
20 37.08	2070	43.25	12720	40.42	6060	38.42	2630	37.83	2160	39.83	4710	46.92	21530	44.33	15310	40.50	6920	36.58	1820	37.20	2120	38.50	3570		
21 37.50	2340	43.17	12880	40.92	6960	38.25	2460	38.00	2270	40.00	6020	47.25	22320	44.83	16510	40.50	6920	37.08	2070	38.50	3570	36.67	1860		
22 37.50	2340	43.08	11570	41.00	7100	38.08	2350	37.83	2160	40.83	7540	48.00	24120	45.08	17110	39.17	4610	37.33	2220	38.75	3940	37.83	2650		
23 37.67	2480	43.08	11870	41.50	8060	38.08	2330	36.75	1680	40.33	6610	45.12	17930	38.83	4070	37.33	2220	38.17	3090	37.58	2400	38.17	3090		
24 37.83	2650	42.83	11300	41.50	8060	38.08	2330	38.33	2540	41.33	8520	47.75	23520	45.50	18120	38.75	3940	37.25	2170	37.08	2070	37.67	2480		
25 39.75	5580	43.50	12840	41.42	7900	38.68	2330	38.33	2540	41.00	7860	47.33	22510	45.83	18910	38.75	3940	37.00	2070	37.50	2340	37.83	2650		
26 42.00	9900	43.00	11690	41.50	8060	36.75	1680	38.33	2540	41.42	8700	47.08	21910	46.42	20330	38.58	3690	36.83	1940	37.42	2280	37.83	2650		
27 42.08	10080	42.67	10930	41.50	8060	36.00	2270	38.33	2540	41.50	8860	46.33	21120	46.38	3630	36.33	1730	37.58	2400	38.17	3090	37.67	2480		
28 41.83	9540	42.58	10740	41.83	8720	38.08	2330	38.17	2400	41.50	9020	46.00	19320	46.33	21120	46.42	3450	38.33	3320	37.63	2400	37.67	2480		
29 41.92	9730	42.50	10560	41.42	7900	38.08	2330	38.00	2270	....	41.58	9020	45.67	18530	45.50	18120	38.75	3940	38.00	2860	37.83	2650		
30 41.50	8860	42.33	10190	41.00	7100	38.00	2270	....	....	40.75	7390	45.42	17930	44.17	14930	38.75	3940	37.83	2650	38.00	2860	37.83	2650
31 41.50	8860	....	....	....	40.42	6060	38.92	3300	....	....	42.00	9900	....	....	43.75	13920	....	....	37.83	2650	....	....	....

Monthly Discharge of Spanish River at Webbwood for year ending
September 30th, 1919

Drainage Area, 4,340 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	10,080	2,070	4,136	2.32	.48	.95	1.10
November "	12,840	3,320	8,714	2.96	.76	2.01	2.24
December "	8,720	5,470	7,067	2.01	1.26	1.63	1.88
January (1919)	5,280	1,660	3,045	1.22	.38	.70	.81
February	3,060	1,660	2,340	.71	.38	.54	.56
March.....	9,900	1,680	4,572	2.28	.39	1.05	1.21
April.....	23,710	5,160	16,589	5.46	1.19	3.82	4.26
May	21,120	13,320	16,792	4.87	3.07	3.87	4.46
June	13,920	3,450	7,613	3.21	.79	1.75	1.95
July.....	3,690	1,730	2,564	.85	.40	.59	.68
August.....	3,940	1,730	2,479	.91	.40	.57	.66
September	3,570	1,680	2,717	.82	.39	.63	.70
The year	23,710	1,660	6,561	5.46	.38	1.51	20.52

Sturgeon River at Smoky Falls

Location—75 feet upstream from the highway bridge at Smoky Falls Post Office, and two miles above the Smoky Falls, Township of Field, Nipissing District.

Records Available—Discharge measurements from August, 1912. Daily gauge heights, January 12 to 31, 1914, and from March 15, 1914.

Drainage Area—2,570 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and attached to a wooden pile on the right, upstream side of the bridge. The zero of the gauge (elevation 32.00) is referred to a bench mark (elevation 53.47) painted on a rock on the right bank of the river, about 175 feet above the bridge.

Channel—Straight for about 700 feet above and about 1 mile below the station. The banks are fairly high, clean, sandy and not liable to overflow. The bed of the stream is composed of clay and sand, slightly shifting. The current is fast and smooth.

Discharge Measurements—Made from boat during all stages.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Regulation—Dams above are used for storage and log driving purposes.

Accuracy—The open water rating curve is fairly well defined. The relation of gauge height to discharge is affected during the log-driving season.

Observer—A. Pineault, Smoky Falls.

Discharge Measurements of Sturgeon River at Smoky Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16	Taylor, J. R....	219	3,638	.70	34.44	2,567
November 27	Loy, R.....	223	3,840	.90	35.42	3,442
December 20	Taylor J. R....	219	3,611	.65	34.29	2,348
1919						
February 25	"	220	3,518	.69	34.58	2,438(a)
March 20	"	220	3,687	.81	34.99	2,999(a)
April 22	"	240	4,963	2.31	40.00	11,565
September 27	"	220	3,824	1.10	35.81	4,212

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Sturgeon River at Smoky Falls for year ending
September 30th, 1919

Date	October		November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Discharge Ht.																							
	Feet	Sec.-ft.																							
1	34.46	2540	36.62	5890	35.17	2560	34.50	2400	35.33	2310	38.42	8770	39.17	9970	34.67	2810	34.87	2100	34.08	2130	34.08	2130	34.08	2130	
2	34.42	2490	36.33	5430	34.33	2690	34.58	2270	35.17	3410	38.58	9030	38.96	9640	34.54	2640	34.67	2810	34.00	2050	34.00	2050	34.00	2050	
3	34.42	2490	36.04	4960	34.62	2750	34.33	2360	34.50	3490	39.04	9760	38.79	9360	34.37	2440	34.00	2050	34.33	2390	34.00	2050	34.33	2390	
4	34.33	2390	35.87	4690	35.08	3430	34.25	2100	34.50	2360	34.58	2450	35.17	3570	39.25	10100	38.79	9360	34.46	2540	33.92	1980	34.00	2050	
5	34.37	2440	35.67	4370	34.87	3100	34.17	2020	34.50	2360	34.50	2360	35.17	3570	39.25	10100	38.71	9240	34.50	2590	34.04	2090	33.92	1980	
6	34.71	2860	35.54	4160	34.79	2980	34.17	2020	34.50	2360	34.50	2360	35.58	4230	39.33	10230	38.50	8900	34.54	2640	34.33	2390	34.00	2050	
7	34.83	3040	35.37	3890	34.75	2920	34.17	2020	34.50	2360	34.46	2360	36.46	5640	39.33	10230	38.50	8900	34.54	2640	34.33	2390	34.12	2170	
8	34.79	2980	35.25	3700	34.75	2920	34.17	2020	34.50	2360	34.25	2100	36.33	5430	39.33	10230	38.83	9430	34.50	2590	34.33	2390	34.33	2390	
9	34.75	2920	35.46	4040	34.79	2980	34.17	2026	34.42	2270	33.79	1720	36.12	5090	39.25	10100	38.92	9570	34.62	2750	34.25	2300	34.33	2270	
10	34.68	2820	35.71	4440	34.54	2690	34.08	1940	34.42	2270	33.71	1600	36.12	5090	39.25	10100	38.71	9170	34.75	2920	34.25	2300	34.62	2270	
11	34.51	2680	35.67	4370	34.37	2440	34.04	1910	34.42	2270	33.67	1650	36.75	6100	39.21	10800	38.50	8900	34.83	3040	34.18	2230	34.87	3100	
12	34.50	2590	35.58	4230	34.42	2490	34.00	1880	34.42	2270	33.62	1620	37.46	7240	39.04	9760	38.29	8560	34.83	3040	33.92	1980	34.96	3240	
13	34.67	2810	35.33	3830	34.42	2490	33.92	1820	34.33	2180	33.58	1600	37.79	7760	39.04	9700	38.04	8160	34.83	3040	33.92	1980	34.00	3300	
14	34.62	2750	35.17	3570	34.37	2490	33.92	1880	34.37	2220	33.71	1680	38.04	8160	38.87	9490	37.67	7570	34.79	2980	33.92	1980	34.92	3170	
15	34.50	2590	35.25	3700	34.33	2390	33.92	1820	34.42	2270	34.04	1910	38.17	8370	38.83	9430	37.29	6960	34.75	2920	33.92	1980	34.54	2640	
16	34.42	2490	35.25	3700	34.33	2390	33.92	1820	34.42	2270	33.75	1600	38.25	8500	38.62	9090	37.00	6500	34.67	2810	33.92	1980	34.42	2490	
17	34.33	2390	35.21	3640	34.54	2640	34.08	1940	34.33	2180	34.54	2400	38.29	8560	38.58	9030	36.79	6160	34.67	2810	33.92	1980	34.25	2300	
18	34.42	2490	35.33	3830	34.42	2490	34.17	2020	34.37	2220	34.83	2760	38.62	9090	39.17	9970	36.79	6160	34.67	2810	34.04	2090	34.29	2350	
19	34.42	2490	35.79	4560	34.33	2830	34.33	2180	34.33	2270	34.50	2990	38.75	9300	39.62	10690	36.79	6160	34.67	2810	34.08	2130	34.37	2440	
20	34.42	2490	36.00	4900	34.29	2350	34.46	2320	34.42	2270	34.70	2990	39.04	9760	39.83	11030	36.75	6100	34.58	2690	34.08	2130	34.71	2860	
21	34.62	2750	36.00	4900	34.25	2200	34.58	2450	34.58	2350	35.17	3410	39.71	10840	39.67	10770	36.79	6160	34.62	2750	34.12	2170	34.83	3040	
22	34.96	2240	35.92	4770	34.37	2330	34.67	2550	34.58	2450	35.12	3330	40.00	11300	39.83	11030	36.67	5970	34.67	2810	33.92	1980	34.25	2300	
23	35.00	3300	35.79	4560	34.67	2490	34.17	2020	34.37	2220	34.83	2760	38.62	9050	39.17	9970	36.79	6160	34.67	2810	34.04	2090	34.29	2350	
24	34.92	3170	35.71	4440	34.62	2490	34.67	2020	34.37	2220	34.83	2760	38.75	9300	39.62	10690	36.79	6160	34.67	2810	34.08	2130	34.55	2540	
25	35.75	4500	35.58	4230	34.62	2490	34.33	2020	34.37	2220	34.83	2760	38.75	9300	39.62	10690	36.79	6160	34.62	2750	34.08	2050	34.54	2160	
26	36.58	5830	35.50	4100	34.58	2490	34.33	2020	34.25	2200	34.58	2450	34.58	2450	35.17	3330	40.00	11300	39.83	4630	34.54	2640	33.96	2010	
27	36.83	6230	35.42	3970	34.37	2330	34.67	2550	34.58	2450	35.17	3410	40.12	11490	40.42	11970	36.50	5700	34.67	2810	34.08	2130	35.00	3300	
28	36.96	6440	35.33	3830	34.37	2220	34.58	2450	34.58	2450	35.17	3410	40.00	11300	40.75	12500	36.33	5810	34.58	2690	34.08	2130	35.15	3540	
29	37.00	6630	35.50	4100	34.33	2180	34.58	2450	34.58	2450	35.17	3410	40.12	11490	40.42	11970	36.50	5700	34.67	2810	34.08	2130	35.75	4500	
30	37.00	6500	35.37	3890	34.25	2100	34.58	2450	34.58	2450	35.17	3410	38.58	9030	39.87	11090	34.75	2920	34.92	3170	33.83	1900	35.75	4500	
31	36.79	6160	35.50	34.29	2140	34.54	2400	34.54	2400	34.54	2400	35.46	3880	35.46	10630	39.58	10630	35.46	2540	34.00	2050	34.46	2540	34.00	2050

Monthly Discharge of Sturgeon River at Smoky Falls for year ending
September 30th, 1919

Drainage Area, 2,570 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area.
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	6,630	2,390	3,467	2.58	.93	1.35	1.56
November "	5,890	3,570	4,290	2.29	1.39	1.67	1.86
December "	3,570	2,100	2,595	1.39	.82	1.01	1.16
January .. (1919)	2,550	1,820	2,177	.99	.71	.85	.98
February	2,450	2,180	2,324	.95	.85	.90	.94
March.....	4,530	1,600	2,718	1.76	.62	1.05	1.21
April.....	11,490	3,410	7,713	4.47	1.33	3.00	3.35
May.....	12,900	8,770	10,548	5.02	3.41	4.10	4.73
June	9,970	2,920	7,050	3.88	1.14	2.74	3.06
July.....	3,700	2,440	2,801	1.44	.95	1.09	1.26
August.....	3,100	1,900	2,158	1.21	.74	.84	.97
September	5,360	1,940	3,014	2.10	.75	1.17	1.30
The year	12,900	1,600	4,245	5.02	.62	1.65	22.42

Vermilion River near Whitefish

Location—At the C.P.R. bridge, two miles east of the Whitefish station, Township of Graham, District of Sudbury.

Records Available—Discharge measurements from August, 1913, to October, 1917. Daily gauge heights from June 11, 1915.

Drainage Area—1,580 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches attached to pile at left abutment of old highway bridge. Zero of the gauge is at an elevation of 25.00 referred to a bench mark elevation 38.39 painted on rock on right bank 15 feet above section.

Channel and Control—Straight for about 300 feet above and 700 feet below the station. Both banks are high, rocky and wooded, and not liable to overflow. Bed of stream is rocky and permanent, current is swift, two channels existing at all stages. At low stages log jams occur at the rapids, causing backwater on the gauge.

Discharge Measurements—Made from the bridge with current meter.

Winter Flow—The relation between the gauge heights and discharge is seriously affected by ice under some conditions.

Observer—A. Boucher, Whitefish.

Daily Gauge Height in feet of Vermilion River near Whitefish for year ending September 30th, 1919

Month	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	27.83	.....	31.08	....	29.92	....	28.33	....	27.75	....	29.25	....	31.25	....	30.92	....	28.42	....	27.75	....	27.50	....	27.50	....
2	27.83	.....	30.75	....	29.67	....	28.25	....	27.75	....	29.25	....	31.17	....	30.75	....	28.33	....	27.75	....	27.42	....	27.42	....
3	27.75	.....	30.50	....	29.58	....	28.25	....	27.75	....	29.33	....	30.00	....	30.50	....	28.17	....	27.75	....	27.42	....	27.42	....
4	27.67	.....	30.33	....	29.42	....	28.17	....	27.67	....	27.33	....	29.42	....	30.42	....	28.08	....	27.75	....	27.33	....	27.33	....
5	27.08	.....	30.17	....	29.25	....	28.17	....	27.67	....	27.33	....	29.58	....	30.92	....	28.00	....	27.67	....	27.33	....	27.33	....
6	27.25	.....	30.08	....	29.08	....	28.08	....	27.67	....	27.33	....	29.83	....	30.17	....	28.00	....	27.67	....	27.33	....	27.33	....
7	27.42	.....	29.92	....	29.25	....	28.08	....	27.67	....	27.33	....	29.00	....	30.83	....	30.08	....	27.92	....	27.58	....	27.58	....
8	27.67	.....	29.92	....	29.17	....	27.00	....	27.58	....	27.42	....	30.17	....	30.75	....	30.17	....	27.92	....	27.58	....	27.58	....
9	27.67	.....	29.00	....	29.17	....	27.00	....	27.58	....	27.33	....	30.92	....	30.75	....	30.17	....	27.83	....	27.58	....	27.58	....
10	27.58	.....	29.83	....	29.17	....	27.92	....	27.58	....	27.33	....	31.33	....	30.67	....	30.17	....	27.83	....	27.42	....	27.42	....
11	27.58	.....	29.67	....	29.92	....	27.92	....	27.58	....	27.42	....	31.67	....	30.58	....	30.08	....	27.83	....	27.33	....	27.33	....
12	27.67	.....	29.58	....	29.17	....	27.00	....	27.58	....	27.42	....	32.50	....	30.50	....	30.08	....	27.75	....	27.33	....	27.42	....
13	27.67	.....	29.33	....	29.08	....	27.00	....	27.50	....	27.50	....	32.75	....	30.50	....	30.08	....	27.75	....	27.33	....	27.42	....
14	27.67	.....	29.17	....	29.17	....	27.00	....	27.50	....	27.50	....	32.67	....	30.33	....	30.08	....	27.83	....	27.17	....	27.50	....
15	27.75	....	29.75	....	28.92	....	29.17	....	27.92	....	27.50	....	32.67	....	30.25	....	29.92	....	27.83	....	27.08	....	27.50	....
16	27.75	....	28.58	....	29.17	....	27.92	....	27.50	....	27.50	....	32.58	....	30.25	....	29.92	....	27.75	....	27.00	....	27.50	....
17	27.92	....	28.75	....	29.17	....	27.92	....	27.50	....	27.67	....	32.50	....	30.33	....	29.67	....	27.75	....	27.00	....	27.50	....
18	27.25	....	29.25	....	29.17	....	27.92	....	27.50	....	27.75	....	32.33	....	30.50	....	29.83	....	27.75	....	27.25	....	27.58	....
19	28.33	....	30.58	....	29.08	....	27.92	....	27.83	....	27.40	....	32.08	....	30.50	....	29.42	....	27.67	....	26.92	....	27.58	....
20	28.33	....	31.33	....	29.08	....	27.00	....	27.42	....	27.00	....	32.08	....	30.58	....	29.33	....	27.75	....	27.00	....	27.67	....
21	28.33	....	31.33	....	28.83	....	27.00	....	27.42	....	28.08	....	31.92	....	30.67	....	29.25	....	27.75	....	27.08	....	27.67	....
22	28.42	....	31.25	....	28.92	....	28.08	....	27.42	....	28.08	....	31.92	....	30.67	....	29.17	....	27.83	....	27.17	....	27.75	....
23	28.42	....	31.17	....	28.92	....	28.08	....	27.42	....	28.25	....	31.83	....	30.75	....	29.00	....	27.92	....	27.25	....	27.75	....
24	28.75	....	30.92	....	28.83	....	28.08	....	27.42	....	28.50	....	31.83	....	31.42	....	28.92	....	28.00	....	27.25	....	28.17	....
25	29.08	....	30.83	....	28.67	....	27.00	....	27.42	....	28.58	....	31.75	....	31.50	....	28.92	....	28.00	....	27.33	....	28.25	....
26	29.08	....	30.75	....	28.33	....	27.00	....	27.33	....	28.75	....	31.67	....	31.58	....	28.83	....	28.00	....	27.33	....	28.25	....
27	29.67	....	30.67	....	28.58	....	27.92	....	27.33	....	28.92	....	31.75	....	31.42	....	28.83	....	28.00	....	27.33	....	28.33	....
28	29.92	....	30.50	....	28.50	....	27.92	....	27.33	....	28.00	....	31.42	....	31.67	....	28.75	....	27.92	....	27.42	....	28.32	....
29	30.92	....	30.33	....	28.50	....	27.83	....	29.08	....	29.08	....	31.33	....	31.50	....	28.67	....	27.92	....	27.42	....	28.50	....
30	30.00	....	30.25	....	28.42	....	27.83	....	29.17	....	29.17	....	31.33	....	31.33	....	28.58	....	27.83	....	27.50	....	28.67	....
31	31.08	....	30.83	....	28.42	....	27.75	....	27.75	....	27.75	....	31.17	....	31.17	....	27.50	....	27.50	....	27.50	....	28.67	....

Wanapitei River at McVittie's

Location—On the C. N. Railway, twenty-three miles south of Sudbury, one mile above McVittie's siding (Power Plant No. 2) and three hundred feet above Ragged Rapids. In the Township of Secord, District of Sudbury.

Records Available—Discharge measurements from September, 1916, and daily gauge heights from October 1st, 1916.

Drainage Area—1,175 square miles.

Gauge—Chain gauge, consisting of 0'-12' of standard gauge plating fastened to cedar tree thirty feet above section. Zero (elevation 99.00) is referred to a B.M. (elevation 105.15), which is the head of a spike driven into stump seven feet south of section on left bank.

Channel—Channel curves slightly above section and is straight below. Banks are wooded and liable to overflow during log jams. Bed of stream is shifting.

Discharge Measurements—Made from boat.

Control—During log driving periods, logs jam at head of falls, three hundred feet below sections, causing backwater.

Observer—J. S. McVittie, McVittie's Siding.

**Discharge Measurement of Wanapitei River at McVittie's, for year
ending September 30th, 1919**

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
Jan. 1919 22.....	Taylor, J. R.	149	2,124	.47	101.01	991 (a)

(a) Ice measurement.

Daily Gauge Height in feet of Wanapitei River at McVittie's for year ending September 30th, 1919

October	November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge																				
	Feet	Sec.-ft.																				
1 100.29	101.33	.....	102.60	.....	101.10	.....	100.81	.....	100.33	.....	101.08	.....	105.75	.....	100.25	.....	101.04	.....	100.25	.....
2 100.37	101.23	....	102.54	....	101.12	....	100.73	....	100.73	....	100.79	....	106.37	....	105.33	....	103.14	....	100.75	....
3 100.33	101.08	....	102.50	....	101.14	....	100.79	....	100.75	....	100.73	....	106.37	....	105.33	....	103.14	....	100.75	....
4 100.44	101.08	....	102.56	....	101.12	....	100.62	....	100.62	....	100.73	....	106.37	....	105.33	....	103.14	....	100.73	....
5 100.60	101.29	....	102.42	....	101.08	....	100.87	....	100.64	....	101.33	....	106.37	....	105.33	....	103.10	....	100.65	....
6 101.19	101.56	....	102.35	....	101.14	....	100.89	....	100.67	....	101.33	....	106.71	....	105.71	....	103.06	....	100.62	....
7 101.37	101.71	....	102.33	....	101.08	....	100.92	....	100.60	....	101.25	....	106.71	....	105.71	....	103.06	....	100.62	....
8 101.27	102.12	....	102.17	....	101.14	....	100.83	....	100.56	....	103.00	....	106.71	....	105.71	....	103.02	....	100.62	....
9 100.87	102.46	....	101.98	....	101.12	....	100.81	....	100.52	....	102.58	....	106.42	....	104.25	....	102.25	....	100.60	....
10 100.62	102.83	....	101.58	....	101.14	....	100.83	....	100.58	....	102.58	....	106.33	....	104.19	....	102.19	....	100.58	....
11 100.64	102.67	....	101.46	....	101.08	....	100.81	....	100.56	....	102.58	....	106.23	....	103.98	....	102.19	....	100.56	....
12 100.85	102.58	....	101.42	....	101.06	....	100.77	....	100.54	....	103.85	....	106.18	....	103.87	....	102.71	....	100.58	....
13 100.94	102.62	....	101.40	....	101.08	....	100.73	....	100.48	....	102.96	....	106.00	....	103.87	....	102.44	....	100.42	....
14 101.00	102.56	....	101.40	....	101.21	....	100.73	....	100.39	....	102.60	....	105.87	....	103.85	....	102.52	....	100.44	....
15 100.92	102.52	....	101.42	....	101.27	....	100.71	....	100.29	....	102.29	....	105.79	....	103.83	....	102.44	....	100.54	....
16 100.85	102.46	....	101.46	....	101.30	....	100.60	....	100.73	....	102.04	....	105.58	....	103.77	....	102.42	....	100.54	....
17 100.62	102.44	....	101.42	....	101.19	....	100.50	....	100.46	....	102.46	....	104.25	....	104.25	....	102.39	....	100.75	....
18 101.00	103.42	....	101.35	....	101.09	....	100.71	....	100.83	....	103.00	....	106.62	....	104.21	....	102.37	....	100.89	....
19 101.19	103.96	....	101.33	....	100.96	....	100.50	....	101.48	....	103.29	....	106.42	....	104.21	....	102.35	....	100.92	....
20 101.08	103.57	....	101.29	....	101.11	....	100.48	....	101.52	....	103.48	....	106.04	....	105.57	....	101.00	....	100.87	....
21 101.15	103.21	....	101.31	....	101.15	....	100.46	....	101.79	....	103.52	....	105.87	....	106.04	....	101.04	....	101.08	....
22 101.17	103.00	....	101.46	....	101.01	....	100.42	....	101.81	....	103.50	....	103.08	....	102.33	....	102.33	....	101.12	....
23 100.96	102.90	....	102.12	....	101.00	....	100.44	....	101.79	....	103.00	....	106.08	....	103.00	....	101.42	....	100.71	....
24 100.94	102.79	....	101.79	....	101.00	....	100.52	....	101.75	....	104.42	....	106.00	....	103.00	....	101.17	....	100.58	....
25 101.44	102.75	....	101.67	....	100.97	....	100.42	....	101.92	....	104.42	....	106.00	....	102.94	....	101.17	....	100.58	....
26 101.62	102.73	....	101.67	....	100.96	....	100.37	....	102.08	....	104.37	....	106.00	....	102.89	....	101.18	....	100.77	....
27 102.54	102.67	....	101.54	....	100.94	....	100.35	....	102.62	....	104.42	....	106.00	....	102.85	....	101.18	....	100.77	....
28 102.04	102.60	....	101.46	....	100.42	....	100.42	....	101.81	....	103.50	....	103.08	....	102.17	....	100.77	....	100.75	....
29 101.87	102.58	....	101.23	....	100.98	....	100.37	....	102.08	....	104.21	....	106.22	....	101.12	....	100.71	....	100.64	....
30 101.67	102.60	....	101.17	....	100.96	....	100.37	....	101.71	....	104.21	....	106.22	....	101.12	....	100.81	....	100.64	....
31 101.37	101.12	....	100.85	....	101.12	....	100.33	....	101.12	....	104.21	....	106.22	....	101.12	....	100.81	....	100.64	....

Regular Stations

NORTH-WESTERN ONTARIO DISTRICT

River	Location	Drainage Area | Sq. Miles	Township	District
Eagle	at Eagle River	970	Aubrey	Kenora
English.....	at Ear Falls	11,700	.....	" .....
"	at Manitou Falls	14,600	.....	" .....
"	near Oak Falls	15,570	.....	" .....
"	at Pine Ridge, H.B.Co's. Post .....	.....	.....	" .....
Turtle.....	at Mountain Rapids	1,760	.....	Rainy River
Wabigoon	near Quibell	2,400	Wabigoon	Kenora

Eagle River at Eagle River

Location—Fifty feet south of the C.P.R. bridge, 300 ft. west of Eagle River Station, near Lot 24, Con. 6, Township of Aubrey, District of Kenora.

Records Available—Discharge measurements and gauge heights from November, 1918.

Also, discharge measurements from January, 1914, to November, 1918, and gauge heights from February, 1914, to November, 1918, at the highway bridge, about 1,000 feet upstream from present section.

Drainage Area—970 square miles.

Gauge—Chain gauge, consisting of 0'-6' of standard gauge plating, on right bank above C.P.R. bridge. Zero, elev. 1,154.41, referred to B.M., elev. 1,163.16, painted with white paint on rock 6 ft. south of line of section.

Channel and Control—Channel is narrow both above and below section, widening out above section. The banks are rocky and wooded, and will not overflow. There is one channel at all stages. There is considerable regulation of the flow at the pulp mill above.

Discharge Measurements—Made from canoe.

Winter Flow—There is no ice effect.

Observer—J. Nelson, Eagle River.

Discharge Measurements of Eagle River (Bridge Section) at Eagle River for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 13.....	Taylor, J. R....	34	112	2.20	1173.87	247
" 15.....	"	34	112	2.21	1173.86	248
" 16.....	"	34	112	2.18	1173.87	243
" 17.....	"	34	115	2.21	1173.94	254

Discharge Measurements of Eagle River (Boat Section) at Eagle River for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 16.....	Taylor, J. R....	44	199	1.22	1156.26	244
" 16.....	"	44	199	1.22	1156.27	243
" 17.....	"	44	204	1.25	1156.35	254
" 17.....	"	44	204	1.24	1156.35	253

**Daily Gauge Height in feet of Eagle River at Eagle River for year ending
September 30th, 1919**

Month	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.	Gauge Ht.	Discharge Ht.
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	1173.68	...1173.66	1156.46	...	1156.41	...	1156.35	...	1156.24	...	1156.25	...	1156.25	...	1157.22	...	1157.39	...	1158.43	...	1160.82	...	1159.78	...
2	1173.66	...1173.66	1156.44	...	1156.37	...	1156.29	...	1156.25	...	1156.27	...	1157.17	...	1157.34	...	1158.89	...	1160.82	...	1159.73	...	1159.65	...
3	1173.66	...1173.63	1156.44	...	1156.37	...	1156.25	...	1156.23	...	1156.28	...	1157.11	...	1157.30	...	1160.27	...	1160.75	...	1159.69	...	1159.66	...
4	1173.63	...1173.61	1156.45	...	1156.35	...	1156.21	...	1156.21	...	1156.27	...	1156.99	...	1157.37	...	1160.33	...	1160.72	...	1159.72	...	1159.66	...
5	1173.66	...1173.59	1156.43	...	1156.32	...	1156.25	...	1156.23	...	1156.28	...	1157.04	...	1157.50	...	1160.64	...	1160.65	...	1159.65	...	1159.58	...
6	1173.68	...1173.61	1156.41	...	1156.28	...	1156.29	...	1156.24	...	1156.26	...	1157.15	...	1157.68	...	1160.91	...	1160.60	...	1159.62	...	1159.53	...
7	1173.70	...1173.63	1156.46	...	1156.41	...	1156.28	...	1156.27	...	1156.28	...	1157.16	...	1157.70	...	1161.01	...	1160.58	...	1159.56	...	1159.56	...
8	1173.70	...1173.70	1156.41	...	1156.33	...	1156.24	...	1156.23	...	1156.37	...	1157.16	...	1157.74	...	1161.08	...	1160.50	...	1159.47	...	1159.47	...
9	1173.66	...1173.70	1156.49	...	1156.33	...	1156.29	...	1156.27	...	1156.39	...	1157.16	...	1157.71	...	1161.16	...	1159.92	...	1159.52	...	1159.52	...
10	1173.63	...1173.74	1156.47	...	1156.30	...	1156.31	...	1156.25	...	1156.43	...	1157.19	...	1157.83	...	1161.16	...	1160.32	...	1159.58	...	1159.52	...
11	1173.61	...1173.78	1156.49	...	1156.30	...	1156.24	...	1156.24	...	1156.45	...	1157.20	...	1157.84	...	1161.15	...	1160.20	...	1159.52	...	1159.52	...
12	1173.63	...1173.82	1156.47	...	1156.23	...	1156.29	...	1156.23	...	1156.49	...	1157.23	...	1157.91	...	1161.16	...	1160.29	...	1159.58	...	1159.58	...
13	1173.63	...1173.82	1156.45	...	1156.33	...	1156.25	...	1156.21	...	1156.48	...	1157.31	...	1157.92	...	1161.18	...	1160.18	...	1159.62	...	1159.62	...
14	1173.61	...1173.84	1156.45	...	1156.24	...	1156.23	...	1156.23	...	1156.47	...	1157.27	...	1157.93	...	1161.16	...	1160.16	...	1159.67	...	1159.67	...
15	1173.61	...1173.84	1156.42	...	1156.23	...	1156.23	...	1156.23	...	1156.51	...	1157.24	...	1157.88	...	1161.16	...	1160.34	...	1159.61	...	1159.61	...
16	1173.59	...1173.86	1156.43	...	1156.23	...	1156.24	...	1156.24	...	1156.53	...	1157.23	...	1157.85	...	1161.11	...	1160.33	...	1159.58	...	1159.58	...
17	1173.59	...1173.91	1156.48	...	1156.24	...	1156.18	...	1156.23	...	1156.53	...	1157.23	...	1157.86	...	1161.14	...	1160.28	...	1159.63	...	1159.63	...
18	1173.66	...1173.91	1156.47	...	1156.24	...	1156.29	...	1156.22	...	1156.55	...	1157.20	...	1157.88	...	1161.16	...	1160.24	...	1159.54	...	1159.54	...
19	1173.68	...1173.95	1156.48	...	1156.31	...	1156.29	...	1156.21	...	1156.59	...	1157.17	...	1157.84	...	1161.16	...	1160.25	...	1159.63	...	1159.63	...
20	1173.68	...1156.39	1156.49	...	1156.30	...	1156.26	...	1156.21	...	1156.65	...	1157.18	...	1157.84	...	1161.16	...	1160.24	...	1159.66	...	1159.66	...
21	1173.63	...1156.34	1156.43	...	1156.20	...	1156.24	...	1156.24	...	1156.51	...	1157.26	...	1157.91	...	1161.16	...	1160.24	...	1159.60	...	1159.60	...
22	1173.63	...1156.42	1156.43	...	1156.33	...	1156.23	...	1156.23	...	1156.53	...	1157.19	...	1157.86	...	1161.16	...	1160.24	...	1159.53	...	1159.53	...
23	1173.61	...1156.46	1156.40	...	1156.33	...	1156.26	...	1156.22	...	1156.78	...	1157.12	...	1157.88	...	1161.16	...	1160.25	...	1159.54	...	1159.54	...
24	1173.59	...1156.48	1156.39	...	1156.31	...	1156.29	...	1156.24	...	1156.84	...	1157.16	...	1157.84	...	1161.16	...	1160.25	...	1159.74	...	1159.74	...
25	1173.51	...1156.45	1156.49	...	1156.40	...	1156.30	...	1156.24	...	1156.25	...	1156.96	...	1157.15	...	1161.02	...	1160.99	...	1159.95	...	1159.79	...
26	1173.61	...1156.45	1156.41	...	1156.30	...	1156.23	...	1156.23	...	1156.75	...	1157.15	...	1157.86	...	1161.13	...	1160.22	...	1159.60	...	1159.60	...
27	1173.59	...1156.44	1156.40	...	1156.39	...	1156.39	...	1156.22	...	1156.78	...	1157.12	...	1157.87	...	1161.09	...	1160.19	...	1159.66	...	1159.65	...
28	1173.66	...1156.46	1156.42	...	1156.40	...	1156.30	...	1156.21	...	1156.26	...	1157.12	...	1157.84	...	1161.04	...	1160.09	...	1159.70	...	1159.70	...
29	1173.66	...1156.48	1156.43	...	1156.39	...	1156.29	...	1156.24	...	1156.78	...	1157.13	...	1157.83	...	1161.02	...	1160.99	...	1159.95	...	1159.74	...
30	1173.63	...1156.49	1156.46	...	1156.37	...	1156.30	...	1156.24	...	1156.73	...	1157.13	...	1157.84	...	1161.01	...	1160.91	...	1159.84	...	1159.66	...
31	1173.61	...1156.49	1156.48	...	1156.38	...	1156.30	...	1156.24	...	1156.76	...	1157.14	...	1157.85	...	1161.00	...	1160.89	...	1159.82	...	1159.66	...

NOTE.—November 20th, change in location of gauge.

English River at Ear Falls

Location—At the foot of Lac Seul, about three miles below Pine Ridge Hudson's Bay Co.'s. Post, and about $\frac{1}{4}$ mile above upper Ear Falls, District of Kenora.

Records Available—Discharge measurements from July, 1914. Weekly gauge heights are secured here and daily gauge heights at a gauge at Pine Ridge Post.

Drainage Area—11,700 square miles.

Gauge—Vertical staff with enamelled face screwed to a 6-inch hewn spruce post which is firmly wedged in the rock of the left bank 200 feet below a 2-inch poplar, which is painted white and used as the initial point for soundings. The zero of the gauge (elev. 115.12) is referred to a bench mark (elev. 122.75) painted on a point of rock 5 feet above the gauge.

Channel and Control—Straight for about 300 feet above and below the station, then turning to the left widens out to the top of the falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream at the section is apparently permanent; the current sluggish, and flowing through one channel at all stages. The natural control is wide, shallow and unobstructed.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—Ice conditions have only slight effect.

Accuracy—Back flow at the left bank causes a little difficulty in making accurate discharge measurements.

Observer—Robert Young, care of Hudson Bay Co.'s. Lac Seul Post, Sioux Lookout P.O.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to gauges at Manitou and Oak Falls. Gauge readings taken on nearly the same day were used in making up curves for the three stations, and the results obtained justify the assumptions made. No allowance is made for lag. With additional data it may be possible to extend the system to points farther down the river.

Daily Gauge Height in feet and Discharge in second-feet of English River at Ear Falls for year ending

September 30th, 1919

Monthly Discharge of English River at Ear Falls for year ending
Sept. 30th, 1919

Drainage Area, 11,700 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	6,400	3,960	5,798	.55	.34	.50	.58
November "	7,350	5,520	6,342	.63	.47	.54	.60
December "	7,810	7,460	7,692	.67	.64	.66	.76
January (1919)	7,580	6,950	7,332	.65	.59	.63	.73
February	6,700	6,190	6,450	.57	.53	.55	.57
March	5,570	3,960	5,028	.48	.34	.43	.50
April	5,210	4,980	5,108	.45	.43	.44	.49
May	5,720	5,450	5,600	.49	.47	.48	.55
June	7,260	5,990	6,732	.62	.51	.58	.65
July	7,580	7,090	7,324	.65	.61	.63	.73
August	7,200	6,870	7,008	.62	.59	.60	.69
September	7,460	6,870	7,192	.64	.59	.61	.68
The year	7,810	3,960	6,469	.67	.34	.55	7.51

English River at Manitou Falls

Location—About 800 feet above the first chute of the Manitou Falls, and five miles below the mouth of the Mattawa River. The Cedar River enters the English River $\frac{1}{2}$ mile below the metering section.

Records Available—Discharge measurements from July, 1914.

Drainage Area—14,600 square miles.

Gauge—Vertical staff with enamelled face screwed to a 6-inch pine post and firmly wedged and wired to the right bank 15 feet south of a 2-inch jack pine, which is used as the initial point for soundings. The zero of the gauge (elev. 89.37) is referred to a bench mark (elev. 100.43) painted on a point of rock 2.5 feet southeast of the initial point.

Channel and Control—About 1,200 feet above the station the channel begins to narrow down and turns to the right out of the lake above. It is comparatively straight thence to the station and falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream is rocky and permanent. The current is slow above and moderately swift at the section.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Manitou Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for "lag."

Daily Gauge Height in feet and Discharge in second-feet of English River at Manitou Falls for year ending
September 30th, 1919

Date	October		November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Discharge Ht.																							
	Feet	Sec-ft.																							
1	91.65	7640	.....	.....	92.75	8950	.....	.....	92.85	9070	.....	.....	90.44	6310	.....	.....	92.51	8660	.....	.....	92.19	8280	.....	.....
2	91.65	7640	90.83	6740	92.04	8100	88.97	4700	91.33	7290	92.30	8410	92.40	8530
3	91.65	7640	.....	.....	92.75	8950	.....	.....	92.85	9070	.....	.....	90.49	6370	.....	.....	92.64	8820	.....	.....	92.51	8660	.....	.....
4	91.65	7640	.....	.....	92.75	8950	.....	.....	92.85	9070	.....	.....	90.75	6660	.....	.....	92.04	8100	.....	.....	92.30	8410	.....	.....
5	91.65	7640	90.83	6740	92.04	8100	88.97	4700	91.33	7290	92.30	8410	92.40	8530
6	91.65	7640	.....	.....	92.75	8950	.....	.....	92.85	9070	.....	.....	90.49	6370	.....	.....	92.64	8820	.....	.....	92.51	8660	.....	.....
7	91.65	7640	90.83	6740	92.04	8100	88.97	4700	91.33	7290	92.30	8410	92.40	8530
8	91.65	7640	.....	.....	92.75	8950	.....	.....	92.85	9070	.....	.....	90.49	6370	.....	.....	92.64	8820	.....	.....	92.51	8660	.....	.....
9	91.75	7760	92.96	9200	91.91	7940	90.88	6800	92.04	8100	92.30	8410	92.40	8530
10	91.75	7760	.....	.....	91.33	7290	.....	.....	92.64	8820	.....	.....	90.88	6800	.....	.....	92.30	8410	.....	.....	92.40	8530	.....	.....
11	91.75	7760	93.06	9320	91.70	7700	90.73	6630	90.23	6080	92.85	9070	92.75	8950
12	91.75	7760	.....	.....	91.85	7870	.....	.....	92.51	8660	.....	.....	91.04	6970	.....	.....	92.70	8890	.....	.....	92.40	8530	.....	.....
13	91.75	7760	93.06	9320	91.54	7520	90.44	6310	90.23	6080	92.57	8730	92.64	8820
14	91.75	7760	93.06	9320	91.54	7520	90.44	6310	90.99	6920	92.40	8530	92.19	8280
15	91.75	7760	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.30	8410	.....	.....	92.40	8530	.....	.....
16	91.59	7580	93.06	9320	91.70	7700	90.73	6630	90.23	6080	92.30	8410	92.40	8530
17	91.59	7580	93.06	9320	91.54	7520	90.44	6310	90.23	6080	92.70	8890	92.40	8530
18	91.59	7580	.....	.....	91.85	7870	.....	.....	92.51	8660	.....	.....	91.04	6970	.....	.....	92.70	8890	.....	.....	92.40	8530	.....	.....
19	91.59	7580	93.06	9320	91.54	7520	90.44	6310	90.99	6920	92.40	8530	92.19	8280
20	91.59	7580	93.06	9320	91.54	7520	90.44	6310	90.49	6370	92.30	8410	92.40	8530
21	91.44	7410	.....	.....	93.06	9320	.....	.....	92.51	8660	.....	.....	91.04	6970	.....	.....	92.70	8890	.....	.....	92.40	8530	.....	.....
22	91.44	7410	.....	.....	93.06	9320	.....	.....	92.51	8660	.....	.....	90.23	6080	.....	.....	92.57	8730	.....	.....	92.40	8530	.....	.....
23	91.44	7410	93.06	9320	91.54	7520	90.44	6310	90.99	6920	92.40	8530	92.19	8280
24	91.44	7410	93.06	9320	91.54	7520	90.44	6310	90.49	6370	92.30	8410	92.40	8530
25	91.44	7410	93.06	9320	91.54	7520	90.44	6310	90.99	6920	92.40	8530	92.19	8280
26	91.44	7410	.....	.....	93.06	9320	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....
27	91.44	7410	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....
28	91.44	7410	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....
29	91.44	7410	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....
30	91.44	7410	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....
31	91.44	7410	.....	.....	92.64	8820	.....	.....	92.27	8370	.....	.....	90.49	6370	.....	.....	92.40	8530	.....	.....	92.40	8530	.....	.....

Monthly Discharge of English River at Manitou Falls for year ending
September 30th, 1919

Drainage Area, 14,600 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	7,760	4,700	7,018	.53	.32	.48	.55
November "	8,820	6,740	7,680	.60	.46	.53	.59
December "	9,320	8,950	9,198	.64	.61	.63	.73
January (1919)	9,070	8,370	8,798	.62	.57	.60	.69
February	8,100	7,520	7,815	.55	.52	.54	.56
March	6,800	4,700	6,110	.47	.32	.42	.48
April	6,370	6,080	6,242	.44	.42	.43	.48
May	6,970	6,660	6,838	.48	.46	.47	.54
June	8,730	7,290	8,132	.60	.50	.56	.62
July	9,070	8,530	8,794	.62	.58	.60	.69
August	8,660	8,280	8,440	.59	.57	.58	.67
September	8,950	8,280	8,645	.61	.57	.59	.66
The year	9,320	4,700	7,811	.64	.32	.54	7.26

English River near Oak Falls

Location—About one mile above the upper Oak Fall, just above Little Rapids, and about one-half mile below Wilcox Lake, District of Kenora.

Records Available—Discharge measurements from August, 1914.

Drainage Area—15,570 square miles.

Gauge—Vertical staff with enamelled face screwed to a cedar post and firmly wedged in rock on the right bank 200 feet above the metering section. The zero of the gauge (elev. 194.12) is referred to a bench mark (elev. 200.00) painted on a rock in the river near the right bank and 20 feet above the final point for soundings. The initial point for soundings is located on the left bank, and consists of the head of a nail driven in the side of a 12-inch poplar blazed and marked I.P., N. 70° W.

Channel and Control—Straight for about 300 feet above and $\frac{1}{2}$ mile below the station. Both banks are high, rocky and wooded, and not liable to overflow. The bed of the stream is rocky and practically permanent. The current is sluggish above and moderately swift below the station, a small rapid existing about 800 feet below.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Oak Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for "lag."

Daily Gauge Height in feet and Discharge in second-feet of English River near Oak Falls for year ending September 30th 1919

Monthly Discharge of English River near Oak Falls for year ending
September 30th, 1919

Drainage Area, 15,570 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	8,100	5,270	7,392	.52	.34	.47	.54
November "	9,360	7,020	8,055	.60	.45	.52	.58
December "	9,990	9,510	9,832	.64	.61	.63	.73
January ... (1919)	9,690	8,790	9,342	.62	.56	.60	.69
February .. "	8,450	7,840	8,155	.54	.50	.52	.54
March	7,080	5,270	6,472	.45	.34	.42	.48
April. "	6,680	6,420	6,564	.43	.41	.42	.47
May..... "	7,240	6,960	7,115	.47	.45	.46	.53
June..... "	9,240	7,620	8,532	.59	.49	.55	.61
July	9,690	9,000	9,336	.62	.58	.60	.69
August	9,180	8,670	8,872	.59	.56	.57	.66
September .. "	9,510	8,670	9,135	.61	.56	.59	.66
The year.....	9,990	5,270	8,236	.64	.34	.53	7.18

English River at Pine Ridge H. B. Co.'s Post

Gauge—This gauge is located on the wharf of the Hudson Bay Company's Post at Pine Ridge and is read by the same man, by whom the Ear Falls gauge is read. This gauge is read daily with the object of securing data to show probable fluctuations at the Ear Falls gauge.

Daily Gauge Height in feet and Discharge in second-feet of English River at Pine Ridge H. B. Co.'s Post for year ending
September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September				
Gauge Ht.	Discharge Ht.																									
Feet	Sec.-ft.																									
1 1	93.47	6990	93.15	6310	93.75	7580	93.89	7880	93.60	7270	93.19	6400	91.95	5900	92.82	5600	92.79	5540	93.07	6140	93.73	7540	93.81	7710		
2	93.33	6690	93.15	6310	93.75	7580	93.88	7860	93.58	7230	93.16	6250	91.94	3880	92.83	5630	93.07	6140	93.90	7940	93.74	7560	93.53	7120		
3	93.37	6780	93.14	6290	93.78	7650	93.89	7880	93.53	7210	93.16	6250	91.94	3820	92.76	5480	93.29	6610	93.85	7800	93.74	7510	93.56	7190		
4	93.45	6950	93.19	6400	93.77	7620	93.89	7880	93.50	7060	93.14	6290	91.91	3830	91.93	3860	92.85	5670	93.36	6760	93.91	7920	93.62	7310	93.64	7350
5	93.49	7040	93.25	6520	93.81	7710	93.89	7880	93.51	7080	93.14	6290	91.92	3820	92.32	4590	92.88	5740	93.43	6910	94.02	8160	93.64	7350	93.66	7400
6	93.47	6990	93.00	5940	93.86	7820	93.91	7920	93.14	7230	93.14	6290	91.93	3820	92.74	5430	92.87	5710	93.90	6820	94.13	8400	93.64	7350	93.74	7560
7	93.56	7190	93.13	6120	93.84	7770	93.94	7980	93.50	7060	93.11	6220	92.74	5430	92.93	5840	93.39	6820	93.91	7920	93.65	7380	93.74	7560		
8	93.26	6550	93.23	6480	93.85	7800	93.90	7900	93.50	7060	93.11	6220	92.74	5430	92.93	5840	93.39	6820	93.91	7920	93.65	7380	93.77	7620		
9	93.26	6550	92.92	5820	93.86	7820	93.94	7980	93.48	7020	93.07	6140	92.71	5390	92.94	5860	93.37	6780	93.58	7230	93.59	7250	93.69	7400		
10	93.26	6550	93.26	6550	93.86	7820	93.81	7710	93.50	7060	93.06	6140	92.71	5370	92.97	5930	93.58	7230	93.80	7690	93.63	7330	93.66	7460		
11	93.41	6820	93.39	6820	93.89	7880	93.82	7730	93.44	6930	93.05	6100	92.68	5310	92.99	5950	93.58	7230	93.80	7780	93.70	7470	93.67	7620		
12	93.16	6330	93.10	6200	93.89	7880	93.82	7730	93.43	6910	93.01	6010	92.72	5390	92.97	5930	93.59	7250	93.85	7800	93.65	7380	93.83	7750		
13	93.12	6240	93.23	6480	93.90	7900	93.82	7730	93.44	6930	93.02	6030	92.69	5330	93.02	6030	93.50	7060	93.96	8030	93.71	7490	93.87	7840		
14	93.31	6650	93.42	6880	93.91	7900	93.81	7710	93.49	6820	93.04	6070	92.65	5310	93.01	6010	93.55	7160	93.74	7560	93.76	7600	93.85	7800		
15	93.21	6510	93.39	6820	93.89	7880	93.83	7750	93.39	6820	93.06	6100	92.65	5240	93.01	6010	93.57	7210	93.79	7670	93.78	7650	93.74	7560		
16	93.29	6610	93.29	6610	93.94	7980	93.79	7670	93.37	6780	92.97	5930	92.64	5220	93.03	6050	93.58	7250	93.85	7800	93.77	7620	93.81	7710		
17	93.23	6480	93.42	6880	93.94	7980	93.81	7710	93.34	6710	92.94	5860	92.64	5220	93.03	6050	93.69	7450	93.89	7880	93.74	7560	93.81	7710		
18	93.35	6730	93.29	6610	93.90	7900	93.82	7730	93.35	6740	92.96	5910	92.67	5290	93.01	6010	93.65	7380	93.87	7840	93.80	7690	93.89	7880		
19	93.20	6480	93.45	6950	93.94	7980	93.81	7730	93.36	6760	92.94	5860	92.64	5220	93.00	6090	93.64	7350	93.80	7880	93.77	7510	93.84	7710		
20	92.96	5910	93.45	6950	93.94	7980	93.78	7650	93.32	6670	92.87	5710	93.64	5220	93.02	6030	93.70	7470	93.88	7860	93.80	7690	93.81	7710		
21	93.32	6670	93.45	6950	93.91	7920	93.74	7650	93.31	6650	92.87	5780	92.69	5330	93.02	6030	93.79	7670	93.80	7690	93.74	7560	93.85	7800		
22	93.01	6010	93.53	7120	93.89	7880	93.72	7510	93.31	6650	92.89	5760	92.64	5220	93.04	6070	93.87	7840	93.86	7820	93.88	7860	93.83	7750		
23	93.17	6300	93.42	6880	93.93	7960	93.73	7540	93.32	6550	92.91	5780	92.66	5270	93.09	6160	93.72	7510	93.81	7730	93.60	7270	93.74	7560		
24	93.24	6380	93.45	6950	93.94	7980	93.70	7540	93.32	6550	92.94	5760	92.64	5220	93.06	6160	93.72	7510	93.82	7730	93.72	7510	93.81	7710		
25	93.15	6310	93.60	7270	93.95	8000	93.70	7470	93.32	6480	92.39	4720	92.71	5370	93.06	6120	93.74	7560	93.85	7800	93.56	7190	93.81	7710		
26	93.19	6400	93.60	7270	93.93	7960	93.64	7350	93.22	6460	92.81	5580	92.76	5480	93.10	6200	93.65	7380	93.81	7710	93.53	7120	94.04	8210		
27	93.10	6380	93.70	7470	93.93	7960	93.68	7440	93.20	6420	92.84	5650	92.71	5370	93.08	6160	93.82	7730	93.47	6990	93.62	7310	93.72	7510		
28	93.10	6200	93.68	7440	93.94	7900	93.62	6420	92.86	5630	92.77	5500	93.03	6050	93.03	7970	93.79	7670	93.86	7450	93.67	7420	93.89	7880		
29	93.14	6290	93.68	7440	93.95	8000	93.66	7400	92.86	5600	92.79	5540	93.06	6120	93.72	7510	93.82	7730	93.72	7510	93.72	7510	93.89	7880		
30	93.12	6240	93.69	7460	93.91	7920	93.65	7380	92.88	5600	92.81	5650	92.85	5670	93.13	6270	93.72	7510	93.71	7490	93.64	7350	93.89	7880		
31	93.07	6140	93.91	7920	93.67	7420	92.84	5650	92.88	5650	92.91	5740	93.22	6460	93.22	6460	93.74	7560	93.70	7470	93.74	7560	93.74	7560		

Monthly Discharge of English River at Pine Ridge H.B. Co.'s Post for
year ending September 30th, 1919

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	7,190	5,910	6,528	.61	.51	.56	.65
November "	7,470	5,820	6,751	.64	.50	.58	.65
December "	8,000	7,580	7,865	.68	.65	.67	.77
January (1919)	7,980	7,350	7,672	.68	.63	.66	.76
February	7,270	6,420	6,832	.62	.55	.58	.60
March.....	6,400	4,720	5,872	.55	.40	.50	.58
April	5,670	3,830	5,133	.48	.33	.44	.49
May	6,460	5,480	5,963	.55	.47	.51	.59
June	7,840	6,140	7,176	.67	.52	.61	.68
July.....	8,400	6,990	7,739	.72	.60	.66	.76
August	7,880	7,120	7,468	.67	.61	.64	.74
September.....	8,210	7,120	7,629	.70	.61	.65	.72
The year	8,400	3,830	6,889	.72	.33	.59	8.00

Turtle River at Mountain Rapids

Location—About 300 feet above Mountain Rapids, and about 8 miles from the Olive Mine, 12 miles from Mine Centre, which is on the C. N. Ry., in the Rainy River District.

Records Available—Monthly discharge measurements from August, 1914. Daily gauge heights from August 9, 1914.

Drainage Area—1,760 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and fastened on a crib pier at the C. N. Ry. saw mill, 12 miles from the station. The gauge is located 1,000 feet south of the mouth of Little Turtle River, on the east shore of Little Turtle Lake. Zero of gauge (elevation 82.99) is referred to a bench mark (assumed elevation 100.00) established on a rock with white paint, 35 feet north-east of the gauge, at the C. N. Ry. mill at Mine Centre.

Channel and Control—Straight for about 1,000 feet above and below the station, the water running slowly. The banks are high, wooded and rocky. The bed of the stream is sandy and clean, one channel existing at all stages. The river is used extensively for log driving, and the log jams in Otter Falls affect the section somewhat.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice and measurements are made during the winter to determine the flow.

Accuracy—Open water rating curve fairly well defined between gauge heights 91.50 and 94.50. The relation of gauge height to discharge during the log-driving period is affected by back water from log jams.

Observer—Hiram Smith, Mine Centre.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Turtle River at Mountain Rapids for year ending
September 30th, 1919

No.	October		November		December		January		February		March		April		May		June		July		August		September					
	Gauge Ht. Feet	Dis-charge Sec-ft.																										
1	91.69	845	92.50	....	93.13	....	92.22	....	91.66	....	91.49	....	91.66	....	90.89	2060	92.82	1410	91.78	885	94.54	2640	92.68	1330		
2	91.67	835	92.54	....	93.07	....	92.20	....	91.63	....	91.49	....	91.68	840	94.91	2880	92.79	1390	91.97	970	94.44	2550	92.60	1280		
3	91.63	820	92.55	....	93.03	....	92.18	....	91.63	....	91.49	....	91.72	860	94.87	2850	92.68	1330	92.78	1380	94.35	2480	92.56	1260		
4	91.61	810	92.58	....	92.99	....	92.13	....	91.63	....	91.49	....	91.82	905	94.82	2900	92.62	1300	94.13	2290	94.20	2350	92.51	1240		
5	91.67	835	92.59	....	92.97	....	92.11	....	91.63	....	91.49	....	91.95	960	94.76	2840	92.58	1270	95.95	4210	94.08	2250	92.45	1200		
6	91.73	865	92.61	....	92.01	....	92.03	....	91.61	....	91.47	....	92.11	1040	94.62	2710	92.56	1260	96.11	4420	94.04	2220	92.38	1170		
7	91.74	870	92.70	....	92.07	....	92.08	....	91.99	....	91.61	....	92.41	1180	94.63	2710	92.52	1240	96.30	4700	94.00	2190	92.36	1160		
8	91.79	890	92.77	....	92.88	....	92.04	....	92.84	....	91.61	....	91.47	....	92.55	1270	94.62	2710	92.49	1220	96.55	5080	93.98	2040	92.29	1120
9	91.81	900	92.81	....	92.90	....	92.08	....	91.99	....	91.61	....	91.47	....	92.66	1320	94.62	2710	92.42	1190	96.45	4920	93.70	1970	92.29	1120
10	91.82	905	93.13	....	92.90	....	92.08	....	91.97	....	91.59	....	91.45	....	92.72	1350	94.58	2680	92.35	1160	96.30	4700	93.62	1910	92.27	1120
11	91.85	915	93.28	....	91.78	....	91.95	....	91.95	....	91.59	....	91.45	....	92.72	1340	94.59	2690	92.31	1140	96.20	4550	93.67	1950	92.26	1110
12	91.89	935	93.38	....	92.76	....	92.03	....	92.74	....	91.91	....	91.57	....	92.45	1270	94.58	2680	92.27	1120	96.16	4490	93.78	2030	92.24	1100
13	91.89	935	93.42	....	92.70	....	92.07	....	91.91	....	91.57	....	91.45	....	92.57	1270	94.53	2630	92.23	1100	96.14	4470	93.74	2000	92.27	1120
14	91.84	915	93.43	....	92.70	....	92.08	....	91.91	....	91.57	....	91.43	....	92.66	1320	94.46	2570	92.17	1060	96.08	4380	93.68	1960	92.30	1130
15	91.82	905	93.43	....	92.80	....	92.08	....	91.97	....	91.59	....	91.45	....	92.72	1350	94.58	2680	92.35	1160	96.30	4700	93.62	1910	92.27	1120
16	91.85	915	93.43	....	92.78	....	91.95	....	91.95	....	91.59	....	91.45	....	92.70	1340	94.59	2690	92.31	1140	96.20	4550	93.67	1950	92.26	1110
17	91.93	955	93.38	....	92.76	....	92.03	....	92.74	....	91.91	....	91.57	....	92.45	1270	94.58	2680	92.27	1120	96.16	4490	93.78	2030	92.24	1100
18	91.97	970	93.54	....	92.82	....	92.08	....	91.91	....	91.57	....	91.45	....	92.57	1270	94.53	2630	92.23	1100	96.14	4470	93.74	2000	92.27	1120
19	91.96	965	93.57	....	92.82	....	91.91	....	91.53	....	91.41	....	91.43	....	92.66	1320	94.46	2570	92.17	1060	96.08	4380	93.68	1960	92.30	1130
20	91.94	960	93.59	....	92.82	....	91.91	....	91.88	....	91.53	....	91.43	....	92.82	1410	94.41	2530	92.08	1020	96.04	4330	93.66	1940	92.29	1120
21	91.93	955	93.61	92.80	91.91	91.86	91.55	91.43	92.82	1410	94.49	2600	94.02	2210	91.89	935	95.52	3650	93.51	1840	92.39	1180
22	91.92	950	93.61	92.61	91.84	91.55	91.43	91.43	93.32	1410	94.65	2750	93.94	2140	91.80	895	95.95	4210	93.62	1910	92.26	1110
23	91.92	950	93.61	....	92.61	....	91.84	....	91.55	....	91.43	....	91.43	....	93.91	2120	94.35	2480	91.99	980	95.84	4060	93.62	1910	92.26	1110
24	91.97	970	93.51	....	92.48	....	91.74	....	91.51	....	91.41	....	91.43	....	94.16	2320	94.23	2380	91.96	965	95.76	3950	93.57	1880	92.28	1120
25	91.99	980	93.47	....	92.41	....	91.72	....	91.51	....	91.41	....	91.43	....	94.32	2450	94.11	2280	91.92	95.07	3790	93.54	1860	92.30	1140	
26	92.05	1010	93.43	....	92.36	....	91.70	....	91.51	....	91.41	....	91.41	....	94.49	2600	94.02	2210	91.89	93.95	3540	93.43	1810	92.26	1110	
27	92.07	1020	93.29	....	92.34	....	91.76	....	91.51	....	91.43	....	91.43	....	94.66	2750	93.94	2140	91.80	895	95.43	3540	93.47	1810	92.26	1120
28	92.12	1040	93.21	....	92.32	....	91.68	....	91.49	....	91.51	....	91.51	....	94.82	2900	93.86	2080	91.83	91.95	3450	93.42	1780	92.50	1230	
29	92.21	1080	93.18	....	92.28	....	91.68	....	91.48	....	91.51	....	91.51	....	94.87	3040	93.72	1980	91.85	92.05	3340	93.34	1730	92.51	1240	
30	92.30	1130	93.16	....	92.26	....	91.66	....	91.46	....	91.51	....	91.51	....	95.07	3140	93.60	1900	91.83	91.95	3200	93.23	1650	92.54	1250	
31	92.40	1180	93.16	....	92.24	....	91.66	....	91.46	....	91.51	....	91.51	....	95.07	3140	93.52	1840	91.83	91.95	3100	93.14	1600	92.67	1320	
32																												

Monthly Discharge of Turtle River at Mountain Rapids for year
ending September 30th, 1919

Drainage Area, 1,760 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,180	810	942	.67	.46	.54	.62
November "							
December "							
January (1919)							
February							
March							
April	3,140	830	1,884	1.78	.47	1.07	1.19
May	2,980	1,440	2,477	1.69	.82	1.35	1.56
June	1,410	845	1,075	.80	.48	.61	.68
July	5,080	885	3,596	2.89	.50	2.04	2.35
August	2,640	1,370	1,930	1.50	.78	1.10	1.27
September	1,410	1,100	1,206	.80	.62	.69	.77
The period	5,080	810	1,865	2.89	.46	1.06	8.40

Wabigoon River near Quibell

Location—About 200 feet above the second fall from the G.T.P. Railway bridge, and $\frac{1}{2}$ mile below the bridge which spans the first fall. One mile east from Quibell Station, Township of Wabigoon, District of Kenora.

Records Available—Discharge measurements from June, 1914.

Drainage Area—2,400 square miles.

Gauge—Vertical staff with enamelled face screwed to a 5-inch hewn spruce post firmly wedged and braced to the rock on the right bank of the river 1,200 feet above the metering section. The zero of the gauge (elev. 1,061.64) is referred to a bench mark (elev. 1,069.46, G.T.P. datum) painted on a point of rock just below the gauge. The initial point for soundings is a spike driven in the rock on the left bank. The gauge is read once a day during open season and once every other day during winter months.

Channel and Control—1,200 feet above the station the channel takes a sharp bend to the right, thence running comparatively straight to the station and falls. The water is sluggish above and moderately swift at the station. The banks are high, rocky and wooded. The bed of the stream is full of boulders and crevices. One channel exists at all stages.

Discharge Measurements—Made from canoe and ice with a small Price current meter.

Regulation—The Dryden Pulp and Power Company operate a plant on the Wabigoon River at Dryden, which runs 24 hours per day with the exception of Sundays and holidays.

Winter Flow—Ice formation is very heavy here, and the winter flow is somewhat disturbed by it.

Accuracy—Rating curve fairly well defined, and estimates for open water flow only have been made.

Observer—D. C. Warner, Quibell.

Daily Gauge Height in feet and Discharge in second-feet of Wabigoon River near Quibell for year ending
September 30th, 1919

October		November		December		January		February		March		April		May		June		July		August		September		
Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	
Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1 11062.56	600	1062.64	.....	1063.81	.....	1063.36	.....	1062.99	.....	1062.56	.....	1062.93	.....	1065.41	2070	1065.26	1980	1064.22	1380	1067.18	3190	1065.72	2250
2 1062.56	600	1062.76	.....	1063.79	.....	1063.87	.....	1062.97	.....	1062.54	.....	1062.99	.....	1065.47	2100	1065.64	2200	1064.72	1650	1066.99	3060	1065.66	2220
3 1062.58	600	1062.72	.....	1063.76	.....	1063.43	.....	1062.95	.....	1062.54	.....	1062.99	.....	1065.97	2400	1065.24	2250	1065.35	2030	1066.89	3000	1065.60	2180
4 1062.58	600	1062.81	.....	1063.74	.....	1063.41	.....	1062.93	.....	1062.58	.....	1063.22	.....	1066.10	2480	1065.81	2310	1067.56	3430	1066.81	2950	1065.53	2140
5 1062.56	600	1062.85	.....	1063.72	.....	1063.39	.....	1062.91	.....	1062.62	.....	1063.56	.....	1066.10	2480	1065.85	2330	1067.72	3540	1066.72	2890	1065.53	2080
6 1062.53	590	1062.93	.....	1063.74	.....	1063.37	.....	1062.89	.....	1062.66	.....	1063.72	.....	1066.06	2460	1065.89	2350	1068.06	3780	1066.64	2840	1065.33	2020
7 1062.53	590	1063.06	.....	1063.76	.....	1063.35	.....	1062.87	.....	1062.68	.....	1063.97	.....	1066.12	2500	1065.97	2400	1068.39	4010	1066.56	2780	1065.18	1930
8 1062.56	600	1063.47	.....	1063.62	.....	1063.35	.....	1062.85	.....	1062.76	.....	1064.06	.....	1066.14	2510	1066.01	2430	1068.74	4240	1066.47	2720	1065.06	1860
9 1062.58	600	1063.97	.....	1063.62	.....	1063.33	.....	1062.83	.....	1062.79	.....	1064.14	.....	1066.18	2540	1066.18	2540	1068.89	4370	1066.31	2620	1064.97	1800
10 1062.56	600	1064.39	.....	1063.60	.....	1063.31	.....	1062.81	.....	1062.76	.....	1064.18	.....	1066.16	2520	1066.28	2600	1068.97	4430	1066.14	2510	1064.89	1750
11 1062.56	600	1064.85	.....	1063.60	.....	1063.28	.....	1062.78	.....	1062.75	.....	1064.14	.....	1066.14	2510	1066.20	2550	1069.06	4500	1065.06	2400	1064.87	1740
12 1062.53	590	1064.81	.....	1063.58	.....	1063.26	.....	1062.76	.....	1062.74	.....	1064.06	.....	1066.16	2520	1066.10	2480	1068.14	4560	1065.95	2390	1064.87	1740
13 1062.56	600	1064.62	.....	1063.58	.....	1063.24	.....	1062.74	.....	1062.72	.....	1063.97	.....	1066.14	2510	1065.83	2320	1069.14	4560	1066.01	2430	1064.89	1750
14 1062.53	590	1064.49	.....	1063.56	.....	1063.22	.....	1062.72	.....	1062.70	.....	1064.22	.....	1066.06	2460	1065.72	2250	1068.99	4440	1066.14	2510	1064.91	1770
15 1062.56	600	1064.35	.....	1063.54	.....	1063.20	.....	1062.68	.....	1062.68	.....	1064.37	.....	1065.97	2400	1065.64	2200	1068.89	4370	1066.16	2520	1064.93	1780
16 1062.56	600	1064.26	.....	1063.51	.....	1063.22	.....	1062.66	.....	1062.66	.....	1064.51	.....	1065.95	2390	1065.31	2100	1068.81	4310	1066.93	2670	1064.95	1790
17 1062.53	590	1064.22	.....	1063.51	.....	1063.18	.....	1062.74	.....	1062.74	.....	1064.56	.....	1065.91	2270	1065.16	1920	1068.74	4270	1066.99	3060	1064.97	1800
18 1062.51	585	1064.56	.....	1063.49	.....	1063.16	.....	1062.64	.....	1062.70	.....	1064.64	.....	1065.87	2340	1065.06	1860	1068.74	4260	1067.14	3160	1065.01	1830
19 1062.53	590	1064.72	.....	1063.49	.....	1063.18	.....	1062.66	.....	1062.72	.....	1064.78	.....	1065.83	2320	1064.97	1800	1068.64	4410	1067.06	3110	1065.06	1860
20 1062.56	600	1064.81	.....	1063.47	.....	1063.18	.....	1062.66	.....	1062.72	.....	1064.97	.....	1065.79	2290	1064.89	1750	1068.53	4110	1066.91	3010	1065.10	1880
21 1062.56	590	1064.72	.....	1063.45	.....	1063.14	.....	1062.64	.....	1062.70	.....	1065.06	.....	1065.56	2160	1064.81	1710	1068.47	4070	1066.81	2950	1065.14	1900
22 1062.56	600	1064.70	.....	1063.43	.....	1063.14	.....	1062.62	.....	1062.68	.....	1065.14	.....	1065.39	2050	1064.70	1640	1068.39	4010	1066.62	2820	1065.12	1890
23 1062.56	600	1064.58	.....	1063.41	.....	1063.12	.....	1062.60	.....	1062.64	.....	1065.18	.....	1065.33	2020	1064.64	1610	1068.45	4060	1066.43	2700	1065.10	1880
24 1062.53	590	1064.49	.....	1063.39	.....	1063.16	.....	1062.66	.....	1062.79	.....	1065.23	.....	1065.26	1980	1064.56	1560	1068.31	3260	1066.24	2580	1065.10	1880
25 1062.31	585	1064.31	.....	1063.37	.....	1063.10	.....	1062.60	.....	1062.81	.....	1065.18	.....	1065.24	1960	1064.47	1510	1068.46	3780	1066.06	2460	1065.14	1900
26 1062.59	605	1064.14	.....	1063.45	.....	1063.14	.....	1062.64	.....	1062.70	.....	1065.26	.....	1065.24	1960	1064.45	1500	1067.93	3260	1065.89	2350	1065.16	1920
27 1062.47	570	1064.06	.....	1063.35	.....	1063.08	.....	1062.58	.....	1062.83	.....	1065.28	.....	1065.22	1950	1064.35	1510	1067.83	3260	1065.89	2350	1065.16	1920
28 1062.47	570	1063.99	.....	1063.37	.....	1063.06	.....	1062.56	.....	1062.83	.....	1065.31	.....	1065.20	1940	1064.33	1440	1067.70	3530	1065.91	2370	1065.14	1900
29 1062.49	575	1063.89	.....	1063.39	.....	1063.03	.....	1062.57	.....	1062.87	.....	1065.33	.....	1065.21	1930	1064.28	1410	1067.56	3430	1065.89	2350	1065.14	1900
30 1062.53	590	1063.83	.....	1063.37	.....	1063.01	.....	1062.58	.....	1062.89	.....	1065.35	.....	1065.20	1940	1064.24	1390	1067.47	3380	1065.85	2330	1065.16	1920
31 1062.56	600	1062.99	.....	1063.35	.....	1062.99	.....	1062.93	.....	1062.93	.....	1065.22	1950	1065.78	2290	1067.33	3280	1065.78	2290	1065.14	1900		

Monthly Discharge of Wabigoon River near Quibell for year ending
September 30th, 1919

Drainage Area, 2,400 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	605	570	594	.25	.24	.25	.29
November "							
December "							
January .. (1919)							
February ..							
March ..							
April ..							
May ..	2,540	1,930	2,258	1.06	.80	.94	1.08
June ..	2,600	1,390	1,992	1.08	.58	.83	.93
July ..	4,560	1,380	3,782	1.90	.58	1.58	1.82
August ..	3,190	2,290	2,689	1.33	.95	1.12	1.29
September ..	2,250	1,740	1,906	.94	.72	.79	.88
The period	4,560	570	2,206	1.90	.24	.92	6.29

Regular Stations

SOUTH-WESTERN ONTARIO DISTRICT

River	Location	Drainage Area Sq. Miles	Township	County
Beaver	near Eugenia Power House		Artemesia	Grey.
"	near Kimberley	100	Euphrasia	"
Credit	at Cataract Jet	85	Caledon	Peel.
Rocky Saugeen	near Markdale	96	Glenelg	Grey.
Saugeen	near Port Elgin	1,565	Saugeen	Bruce.
"	near Walkerton	850	Brant	"
Sydenham	near Owen Sound	71	Derby	Grey.
Thames, Main stream	at Kilworth	1,270	Delaware	Middlesex.
" North	near Fanshawe	585	London	"
" South	near Ealing	515	London and Westminster	"

Beaver River near Eugenia Power House

Location—About 400 feet from the power house and above the tail race outlet, at the bridge known as Hislop's Bridge.

Records Available—Discharge measurements from August, 1918, and gauge readings from September 1st, 1918.

Gauge—3 ft. of standard gauge plates on downstream side of bridge, zero of gauge=1.00.

Channel and Control—The channel is straight for about 250 ft. above and below the section. The banks are low but not liable to overflow. The bed of the stream is clean and rocky, one channel existing at all stages.

Discharge Measurements—Made by wading at all stages.

Regulation—This section only receives part of the flow from the drainage basin above it, part of the water on the basin coming through the Eugenia Power Plant. For this reason the area tributary to this section is not determinable.

Observer—George Dawson, Markdale.

Discharge Measurements of Beaver River near Eugenia Power House for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16.....	Roberts, E.	35	16	1.00	1.50	16.13
November 13.....	"	35	18	1.25	1.57	23.08
December 5.....	"	30	18	1.38	1.58	24.88 (a)
1919						
January 2.....	"	34	26	1.50	1.75	39.69
February 2.....	"	32	24	1.31	1.75	31.53 (a)
" 24.....	"	32	20	1.75	1.62	35.46
May 14.....	"	54	55	2.99	2.10	163.98
July 4.....	"	40	34	2.44	1.89	83.44
" 7.....	"	45	35	1.97	1.85	69.64
" 15.....	"	41	26	1.42	1.71	37.40
September 9.....	"	35	16	.93	1.50	14.90

(a) Ice measurement.

TWELFTH ANNUAL REPORT OF THE

Daily Gauge Height in feet and Discharge in second-feet of Beaver River near Eugenia Power House for year ending
September 30th, 1919

Sec-A	October		November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht.	Discharge																								
	Feet	Sec-ft.																								
1	1.49	15	1.53	19	1.77	53	1.69	53	1.79	54	2.12	175	2.17	203	2.00	116	1.75	49	1.73	45	1.71	42	1.71	42		
2	1.50	16	1.55	22	1.75	49	1.71	49	1.87	60	2.12	175	2.17	203	2.00	116	1.75	49	1.73	45	1.71	42	1.71	42		
3	1.50	16	1.57	24	1.71	42	1.71	42	1.83	56	2.08	154	2.21	226	2.00	116	1.75	49	1.71	42	1.71	42	1.71	42		
4	1.48	15	1.48	20	1.54	30	1.54	20	1.77	56	2.08	154	2.29	270	1.96	103	1.75	49	1.73	45	1.71	42	1.71	42		
5	1.52	18	1.55	26	1.55	22	2.52	22	1.81	56	2.08	154	2.29	270	1.96	103	1.75	49	1.73	45	1.71	42	1.71	42		
6	1.51	17	1.56	23	1.62	32	2.67	32	2.64	56	1.75	49	1.92	90	2.29	270	2.00	116	1.85	70	1.73	45	1.67	36		
7	1.52	18	1.56	23	1.64	32	2.64	32	2.61	56	1.75	49	1.92	90	2.29	270	2.00	116	1.75	49	1.73	45	1.67	36		
8	1.50	16	1.61	28	1.59	26	1.96	26	1.96	56	1.75	49	1.92	90	2.25	248	1.96	103	1.75	49	1.73	45	1.67	36		
9	1.50	16	1.69	39	1.60	27	1.81	27	1.81	56	1.71	49	1.92	90	2.25	248	1.96	103	1.75	49	1.73	45	1.67	36		
10	1.50	16	1.64	32	1.67	36	2.21	36	2.21	56	1.71	49	1.98	109	2.31	282	1.96	103	1.75	49	1.71	42	1.67	36		
11	1.50	16	1.68	37	1.71	42	2.31	42	2.31	56	1.71	42	2.00	116	2.33	293	1.92	90	1.75	49	1.71	42	1.67	36		
12	1.50	16	1.59	37	1.56	32	2.33	32	2.33	56	1.71	42	2.06	145	2.29	270	1.92	90	1.75	49	1.71	42	1.67	36		
13	1.56	23	1.57	24	1.64	32	2.21	32	2.21	56	1.71	49	1.92	90	2.17	203	2.19	214	1.87	76	1.75	49	1.71	42	1.67	36
14	1.50	16	1.54	20	1.92	90	2.10	90	2.10	56	1.71	49	2.17	203	2.10	164	1.87	76	1.75	49	1.71	42	1.67	36		
15	1.50	16	1.54	20	1.87	76	2.10	76	2.10	56	1.71	49	2.17	203	2.08	154	1.87	76	1.75	49	1.71	42	1.67	36		
16	1.50	16	1.68	37	1.71	42	2.31	42	2.31	56	1.71	42	2.25	248	2.17	203	2.17	187	1.75	49	1.71	42	1.67	36		
17	1.50	16	1.59	37	1.56	32	2.33	32	2.33	56	1.71	42	2.06	145	2.29	270	1.92	90	1.75	49	1.71	42	1.67	36		
18	1.50	16	1.59	35	1.66	35	1.69	35	1.69	56	1.67	49	1.92	90	2.17	203	2.14	186	1.83	66	1.73	45	1.75	49		
19	1.49	15	1.66	35	1.61	28	1.62	28	1.62	56	1.67	49	1.92	90	2.17	203	2.14	186	1.81	60	1.73	45	1.75	49		
20	1.64	32	1.65	34	1.58	25	1.73	25	1.73	56	1.65	49	1.92	90	2.17	203	2.19	214	1.87	56	1.73	45	1.75	49		
21	1.55	22	1.62	30	1.59	26	1.71	26	1.71	56	1.71	49	2.08	154	2.17	203	2.17	203	1.79	56	1.73	45	1.75	49		
22	1.56	23	1.54	20	1.77	53	1.79	53	1.79	56	1.71	49	2.00	116	2.17	203	2.17	203	1.79	56	1.73	45	1.75	49		
23	1.42	10	1.53	19	1.77	53	1.79	53	1.79	56	1.71	49	2.10	164	2.17	203	2.12	175	1.79	56	1.73	45	1.75	49		
24	1.42	10	1.56	23	1.70	40	1.77	40	1.79	56	1.62	49	2.06	145	2.19	214	2.12	175	1.79	53	1.73	45	1.75	49		
25	1.42	10	1.57	24	1.94	96	1.83	96	1.83	56	1.62	49	2.17	203	2.17	203	2.08	154	1.78	54	1.73	45	1.75	49		
26	1.42	10	1.56	23	2.00	116	1.75	116	1.75	56	1.62	49	2.17	226	2.17	203	2.08	154	1.79	56	1.73	45	1.75	49		
27	1.54	20	1.52	18	2.12	175	1.73	175	1.73	56	1.62	49	2.17	226	2.17	203	2.08	154	1.79	56	1.69	45	1.75	49		
28	1.59	26	1.52	18	2.02	126	1.71	126	1.71	56	1.62	49	2.17	203	2.17	203	2.08	154	1.77	53	1.73	45	1.75	49		
29	1.58	25	1.59	26	1.85	70	1.71	70	1.71	56	1.62	49	2.17	203	2.17	203	2.08	154	1.75	53	1.73	45	1.75	49		
30	1.54	20	1.48	25	1.70	40	1.67	40	1.67	56	1.62	49	2.17	203	2.12	175	2.04	135	1.75	49	1.73	45	1.75	49		
31	1.52	18	1.60	27	1.67	27	1.67	27	1.67	56	1.60	49	2.08	154	2.04	135	2.04	135	1.73	45	1.71	42	1.67	36		

Monthly Discharge of Beaver River near Eugenia Power House for
year ending September 30th, 1919

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off Depth in Inches on Drainage Area.
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	32	10	17	.....	.....	.....	.....
November "	39	18	25	.....	.....	.....	.....
December "	175	20	52	.....	.....	.....	.....
January .. (1919)	.....	.....	.....	.....	.....	.....	.....
February ..	.....	.....	.....	.....	.....	.....	.....
March	226	32	118	.....	.....	.....	.....
April	248	90	174	.....	.....	.....	.....
May	293	135	208	.....	.....	.....	.....
June	126	49	80	.....	.....	.....	.....
July	70	39	48	.....	.....	.....	.....
August	49	42	46	.....	.....	.....	.....
September	42	36	37	.....	.....	.....	.....
The period.....	293	10	81	.....	.....	.....	.....

Beaver River near Kimberley

Location—At Hill's bridge, about 2 miles above Kimberley, on the south half of lot 2, concession 5, Township of Euphrasia, County of Grey.

Records Available—Discharge measurements at Weber's Bridge, September, 1914, to January, 1915. Discharge measurements April 25, 1915, to date, at Hill's Bridge. Daily gauge heights from April 25, 1915.

Drainage Area—100 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on left bank 20 feet downstream from bridge. Zero of gauge is 0.00.

Channel and Control—Channel straight above and below for a distance of 200 feet. The banks and control are permanent under ordinary conditions. The bed is composed of stones and gravel, one channel existing at all stages.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 20 feet above the bridge for the low-water stages.

Regulation—The Hydro-Electric Power Commission's power plant located three-quarters of a mile upstream, though a twenty-four hour power, has a marked effect on the river stage at this section.

Accuracy—The rating curve is fairly well defined, but open-water estimates are subject to errors, due to fluctuations in stage caused by operation of power plant.

Observer—Mrs. Annie Turner, Kimberley P.O.

Discharge Measurements of Beaver River near Kimberley for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16.....	Roberts, E.	57	46	2.23	.96	103
December 5.....	"	58	49	2.56	1.05	124
1919						
January 2.....	"	58	59	2.36	1.17	142
February 2.....	"	58	36	1.95	.77	71
" 24.....	"	58	55	2.04	1.08	113(a)
June 14.....	"	58	50	2.59	1.17	131
September 9.....	"	57	42	2.26	.92	94

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Beaver River near Kimberley for year ending
September 30th, 1919

Sec. No.	Gauge Ht., Feet	October		November		December		January		February		March		April		May		June		July		August		September						
		Gauge Ht., Feet	Dis- charge Sec.-ft.																											
		Gauge Ht., Feet	Dis- charge Sec.-ft.																											
1	.92	.89	.83	.76	1.04	1.08	.87	.81	.96	.95	1.08	.81	.87	.81	.95	1.08	.81	.75	.243	1.42	.175	1.17	.129	.67	.52	.75	.64	.92	.89	
2	.92	.89	.83	.76	1.04	1.08	.87	.81	.96	.95	1.08	.81	.87	.81	.95	1.08	.81	.75	.243	1.50	1.25	1.43	.83	.76	.62	.64	.92	.89		
3	.96	.95	.79	.70	.83	.76	1.04	.88	.96	.95	1.08	.81	.87	.81	.95	1.08	.81	.75	.243	1.75	2.43	1.29	.150	.83	.76	.62	.46	.92	.89	
4	.92	.89	1.00	1.01	.87	.81	1.33	.85	.96	.95	1.04	.82	.87	.81	.95	1.04	.82	.75	.234	1.71	2.34	1.21	.137	.79	.70	.71	.58	.87	.82	
5	.92	.89	1.00	1.01	.87	.81	1.10	.92	.96	.95	1.04	.82	.87	.81	.95	1.04	.82	.75	.243	1.75	2.12	1.17	.129	.83	.76	.75	.65	.87	.82	
6	.67	.52	.92	.89	.83	.76	1.46	.82	.92	.91	1.17	.130	.118	.92	.95	1.17	.130	.112	.121	2.00	3.05	1.50	1.90	1.04	1.08	.75	.75	.65	.92	.89
7	.96	.92	.89	.81	.96	.95	1.12	.121	.108	.92	1.04	.82	.87	.81	.95	1.04	.82	.75	.285	1.50	1.92	1.33	.158	.108	.115	.67	.52	.79	.70	
8	.92	.89	1.08	1.15	.83	.76	1.04	.88	.92	.91	1.00	.81	.83	.81	.95	1.00	.81	.75	.253	1.33	1.58	1.79	.253	.92	.89	.71	.58	.87	.82	
9	1.00	1.01	1.29	1.50	1.00	1.01	.92	.89	.79	.70	1.00	.92	.89	.89	.95	1.00	.92	.75	.272	1.89	1.87	1.87	.272	.87	.82	.75	.65	.79	.70	
10	.92	.89	1.04	1.08	1.08	1.08	1.08	1.15	1.37	1.65	.92	.89	.89	.89	.95	1.04	.108	.108	.206	1.79	2.53	1.25	.143	.83	.76	.76	.79	.70	.67	.52
11	.92	.89	.96	.95	1.00	1.01	1.21	1.37	1.17	1.30	1.04	1.08	1.08	1.08	1.05	1.04	1.08	.79	.253	1.71	2.34	1.25	.143	.83	.76	.83	.76	.87	.82	
12	.92	.89	1.08	1.15	.96	.95	1.50	.90	.94	.92	1.04	.82	.87	.81	.95	1.04	.82	.75	.225	1.29	1.67	2.25	1.17	.129	.79	.70	.96	.95	.96	.95
13	.83	.76	1.04	1.08	1.00	1.01	1.58	.92	.96	.95	1.00	1.01	1.01	1.01	1.00	1.00	1.01	.83	.262	1.62	2.14	1.24	.143	.79	.70	.96	.95	.96	.95	
14	.83	.76	1.00	1.01	1.01	1.02	1.02	1.28	1.00	1.01	1.00	1.01	1.01	1.01	1.00	1.00	1.01	.83	.272	1.87	1.87	1.87	.272	.87	.82	.76	1.00	1.01	1.01	
15	.96	.95	.96	.95	.96	.95	.96	.96	.96	.95	.96	.95	.95	.95	.95	.95	.95	.95	.206	1.75	2.43	1.62	.214	.108	.115	.83	.76	1.00	1.01	
16	.96	.95	.96	.95	.96	.95	.96	.96	.95	.95	.96	.95	.95	.95	.95	.95	.95	.95	.262	1.71	2.34	1.62	.214	.108	.115	.79	.70	.83	.82	
17	.86	.81	.75	.64	.84	.81	.87	.81	.92	.89	.82	.87	.81	.87	.81	.87	.81	.83	.286	1.92	2.34	1.67	.225	.108	.115	.79	.70	.87	.82	
18	.92	.89	1.04	1.08	1.04	1.08	.94	.92	.96	.95	1.04	.82	.87	.81	.95	1.04	.82	.75	.262	1.83	1.83	1.54	.262	.83	.76	.96	.95	.96	.95	
19	.87	.81	1.12	1.21	1.04	1.08	.79	.70	.94	.92	1.04	.82	.87	.81	.95	1.04	.82	.75	.272	1.79	2.14	1.62	.214	.108	.115	.79	.70	.96	.95	
20	.96	.95	.95	.98	1.15	1.08	1.15	.96	.92	.89	1.05	1.08	1.05	1.05	1.04	1.04	1.04	.89	.206	1.98	2.14	1.62	.214	.108	.115	.79	.70	.96	.95	
21	1.00	1.01	1.00	1.01	1.01	1.01	1.08	1.15	.87	.81	.92	.95	1.00	1.01	1.07	1.06	1.05	.89	.225	1.62	2.14	1.62	.214	.108	.115	.79	.70	.96	.95	
22	.87	.81	.96	.95	.95	.95	.95	.95	.96	.95	.95	.95	.95	.95	.95	.95	.95	.95	.272	1.87	2.34	1.62	.214	.108	.115	.79	.70	.96	.95	
23	.96	.95	.92	.89	.87	.81	.87	.81	.87	.81	.87	.81	.87	.81	.87	.81	.87	.81	.206	1.58	2.06	1.62	.214	.108	.115	.79	.70	.96	.95	
24	.92	.89	.87	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.81	.305	1.58	1.58	1.54	.198	.108	.115	.79	.70	.96	.95	
25	.83	.76	.83	.76	.83	.76	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.296	1.79	2.53	1.98	.198	.108	.115	.79	.70	.96	.95	
26	.83	.76	.92	.89	.89	.81	.94	.108	.83	.76	.92	.95	.95	.95	.95	.95	.95	.95	.351	1.79	2.53	1.98	.198	.108	.115	.79	.70	.96	.95	
27	.75	.64	.83	.76	.83	.76	.92	.112	.121	.108	.115	.108	.115	.108	.115	.108	.115	.108	.214	1.62	2.14	1.62	.214	.108	.115	.79	.70	.96	.95	
28	.96	.95	.92	.89	.89	.81	.92	.108	.115	.100	.101	.101	.101	.101	.101	.101	.101	.101	.206	1.58	2.06	1.62	.214	.108	.115	.79	.70	.96	.95	
29	.96	.95	1.00	1.01	.92	.89	.92	.108	.101	.101	.101	.101	.101	.101	.101	.101	.101	.101	.305	1.54	1.54	1.54	.198	.108	.115	.79	.70	.96	.95	
30	.92	.89	.92	.89	.92	.81	.94	.108	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.243	1.75	1.75	1.75	.198	.108	.115	.79	.70	.96	.95	
31	.92	.89	.92	.89	.92	.81	.94	.108	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.253	1.79	1.79	1.79	.198	.108	.115	.79	.70	.96	.95	

Monthly Discharge of Beaver River at Kimberley for year ending
September 30th, 1919

Drainage Area, 100 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	101	52	87	1.01	.52	.87	1.00
November "	150	64	96	1.50	.64	.96	1.07
December "	285	76	114	2.85	.76	1.14	1.31
January .. (1919)	206	70	115	2.06	.70	1.15	1.33
February	147	70	98	1.47	.70	.98	1.02
March	469	81	224	4.69	.81	2.24	2.58
April	362	121	225	3.62	1.21	2.25	2.51
May	337	158	230	3.37	1.58	2.30	2.65
June	190	52	122	1.90	.52	1.22	1.36
July	115	32	72	1.15	.32	.72	.83
August	108	46	85	1.08	.46	.85	.98
September	101	52	90	1.01	.52	.90	1.00
The year	469	32	130	4.69	.32	1.30	17.65

Credit River at Cataract Junction

Location—About 500 feet from C.P.R. station at Cataract Junction, lot 14, concession 3, Township of Caledon, County of Peel.

Records Available—Discharge measurements from June, 1912. Daily gauge heights from May 7, 1915.

Drainage Area—85 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on right bank. Zero of gauge (elevation 8.00) is referred to a B.M. (elevation 10.00) painted on rock 100 feet downstream from metering section.

Channel and Control—The channel is straight for about 350 feet above and 300 feet below the section. The right bank is low, and overflows during high stages. The bed is composed of gravel, which is shifting during flood stages.

Discharge Measurements—Made at permanent wading section at all stages.

Winter Flow—Relation of gauge height to discharge is affected by ice, and measurements are made to determine this flow.

Regulation—The dam at Erin, about four miles upstream, causes serious fluctuations in the river stage at this section. Semi-daily gauge readings will not give a representative mean.

Accuracy—A fairly well-defined rating curve has been established for this station. The accuracy of the estimates of discharge depends upon the accuracy of the mean daily gauge heights.

Observer—Alfred Riches, Cataract Junction.

Discharge Measurements of Credit River at Cataract Junction for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 22.....	Roberts, E.....	40	30	1.72	8.71	51
1919						
Jan. 15.....	"	22	26	1.53	9.04	54 (a)
Feb. 19.....	"	40	42	.69	8.96	29(a)
May 25.....	"	41	37	2.22	8.86	81
Sept. 17.....	"	41	20	1.06	8.50	21

(a) Ice measurement.

**Daily Gauge Height in feet and Discharge in second-feet of Credit River at Cataract Junction for year ending
September 30th, 1919**

Gauge Ht. Sec-ft.	October	November		December		January		February		March		April		May		June		July		August		September		
		Gauge Ht.	Discharge Ht.																					
		Feet	Sec-ft.																					
1	8.55	24	8.67	36	8.73	31	8.77	26	8.69	16	8.73	31	8.75	47	8.64	32	8.62	30	8.54	23	8.46	18	8.44	18
2	8.58	25	8.58	26	8.69	27	8.80	28	8.83	22	8.77	36	8.71	41	8.81	57	8.60	28	8.54	23	8.46	18	8.50	20
3	8.56	25	8.55	24	8.63	22	8.77	26	8.83	22	8.77	36	8.71	41	8.77	50	8.62	30	8.54	23	8.44	18	8.48	19
4	8.58	26	8.65	33	8.64	23	9.46	172	8.59	12	8.85	47	8.73	44	9.37	209	8.60	28	8.52	22	8.42	17	8.50	20
5	8.52	22	8.71	41	8.77	36	9.98	381	8.67	15	9.11	101	8.75	47	9.39	216	8.58	26	8.50	20	8.50	20	8.46	18
6	8.57	26	8.63	31	8.71	29	10.17	475	8.61	12	10.12	103	8.79	53	9.02	103	9.10	124	8.58	26	8.46	18	8.46	18
7	8.68	37	8.65	33	8.85	47	10.21	495	8.71	16	9.00	125	8.92	80	8.85	65	8.94	84	8.46	202	8.60	28	8.46	18
8	8.64	32	8.62	30	8.68	26	9.85	322	8.81	21	8.89	53	8.89	73	8.81	57	8.94	84	8.56	25	8.46	18	8.46	18
9	8.58	26	8.68	37	8.71	29	9.56	205	8.69	16	8.67	26	8.96	89	8.75	47	8.81	57	8.56	25	8.42	17	8.44	18
10	8.54	23	8.72	42	8.72	42	9.12	103	9.85	322	8.83	22	8.73	31	9.08	119	8.77	50	8.73	44	8.50	20	8.42	17
11	8.55	24	8.68	37	9.07	75	9.47	175	8.97	36	8.71	29	8.67	209	9.35	202	8.67	36	8.52	22	8.46	18	8.46	18
12	8.55	24	8.65	33	8.69	27	9.64	234	8.62	13	8.75	34	9.12	130	9.23	163	8.67	36	8.46	18	8.46	18	8.46	18
13	8.51	21	8.60	28	8.67	26	9.17	91	8.54	10	8.77	36	8.98	93	8.98	93	8.62	30	8.48	19	8.44	18	8.46	18
14	8.54	23	8.81	41	9.59	216	8.53	9	8.87	50	8.87	69	8.85	65	8.58	26	8.54	23	8.46	18	8.44	18	8.44	18
15	8.56	25	8.59	27	9.12	103	9.06	49	8.66	18	8.81	41	8.83	61	8.77	50	8.54	23	8.48	19	8.60	28	8.46	18
16	8.54	23	8.59	27	9.00	75	9.12	59	8.79	27	8.85	47	9.04	108	8.75	47	8.60	28	8.46	18	8.46	18	8.46	18
17	8.60	28	8.59	27	8.93	61	8.92	30	8.81	29	9.96	470	9.50	257	8.85	65	8.54	23	8.50	20	8.60	28	8.42	17
18	8.56	25	8.64	32	8.81	41	8.69	16	8.64	18	13.75	2360	9.12	130	8.81	57	8.56	25	8.50	20	8.67	36	8.42	17
19	8.54	23	8.65	33	8.72	30	8.62	13	8.79	27	10.42	700	8.96	89	8.75	47	8.54	23	8.54	23	8.44	18	8.54	23
20	8.68	37	8.62	30	8.63	22	8.73	17	8.92	42	10.25	615	8.87	69	8.83	61	8.56	25	8.46	18	8.56	25	8.50	20
21	8.69	38	8.60	28	8.67	26	8.61	12	8.61	16	10.17	575	8.81	57	9.06	114	8.58	26	8.54	23	8.56	25	8.50	20
22	8.65	33	8.56	25	9.00	75	8.61	12	8.67	19	9.64	317	8.77	50	9.21	156	8.52	22	8.54	23	8.58	26	8.60	28
23	8.57	26	8.54	23	8.71	16	8.56	14	9.48	249	8.75	47	9.12	130	8.96	89	8.54	23	8.50	20	8.54	23	8.46	18
24	8.54	23	8.52	22	8.94	63	8.85	24	8.61	16	9.35	202	8.75	47	8.87	69	8.58	26	8.46	18	8.54	23	8.52	22
25	8.57	26	8.62	30	8.80	28	8.94	32	8.58	15	9.31	188	8.71	41	8.81	57	8.77	50	8.54	23	8.52	22	8.46	18
26	8.65	33	8.58	26	8.94	45	8.81	21	8.79	27	9.29	182	8.69	38	8.81	57	8.77	50	8.54	23	8.52	22	8.46	18
27	8.65	33	8.56	23	8.54	23	8.54	23	8.56	14	9.48	249	8.75	47	8.73	44	8.67	36	8.46	18	8.50	20	8.44	18
28	8.60	28	8.52	22	8.94	45	8.62	13	8.62	17	9.29	182	8.75	47	8.73	44	8.58	26	8.48	19	8.50	20	8.48	19
29	8.81	57	8.60	20	8.81	29	8.67	15	8.60	12	8.69	38	8.56	25	8.54	23	8.48	19	8.54	23	8.48	19	8.54	23
30	8.69	38	8.71	29	8.64	18	8.64	12	8.60	15	9.00	98	8.73	44	8.67	36	8.58	26	8.50	20	8.46	18	8.50	20
31	8.73	44	8.71	29	8.79	27	8.79	27	8.79	27	8.83	61	8.67	28	8.60	28	8.48	19	8.48	19	8.48	19	8.48	19

Monthly Discharge of Credit River at Cataract Junction for year ending
September 30th, 1919

Drainage Area, 85 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	57	21	29	.67	.25	.34	.39
November "	42	20	29	.49	.24	.34	.38
December "	121	18	45	1.42	.21	.53	.61
January (1919)	495	12	114	5.82	.14	1.34	1.54
February	42	9	20	.49	.11	.24	.25
March	2,360	26	238	27.76	.31	2.80	3.23
April	257	38	77	3.02	.45	.91	1.02
May	216	28	82	2.54	.33	.96	1.11
June	202	22	41	2.38	.26	.48	.54
July	28	18	22	.33	.21	.26	.30
August	36	17	20	.42	.20	.24	.28
September	28	17	19	.33	.20	.22	.24
The year	2,360	9	62	27.76	.11	.73	9.91

Rocky Saugeen River near Markdale

Location—At the Glen Cross highway bridge, three-quarters of a mile above Hayward's Falls, near lot 5, concession 8, Township of Glenelg, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 8, 1915.

Drainage Area—96 square miles.

Gauge—Vertical staff 0 to 6 feet on the downstream side of the centre pier of bridge. The zero of gauge (elevation 0.00) is referred to a B.M. (elevation 29.65) painted on a rock projecting from bank 40 feet north from first telephone pole on left bank.

Channel and Control—The channel is straight for 200 feet above and 500 feet below the station. The bed and banks are permanent, as flood conditions do not exist on this stream.

Discharge Measurements—Made at a permanent wading section. When the river is extremely high measurements will be made from the bridge.

Winter Flow—Ice has but little effect at this section and the open water curve is at all times applicable.

Regulation—The dam above has little effect on the river stage at this section.

Accuracy—The rating curve is well defined except for maximum flows.

Observer—Mrs. Elizabeth Jack, Markdale.

Discharge Measurements of Rocky Saugeen River near Markdale for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 1.....	Roberts, E.	72	70	.90	1.27	63
December 4.....	"	74	80	1.03	1.46	82
1919						
January 1.....	"	78	110	1.13	1.75	124
February 1.....	"	77	107	1.16	1.71	124
" 22.....	"	71	90	1.13	1.50	101
May 9.....	"	82	146	1.48	2.21	218
" 16.....	"	81	122	1.23	1.92	151
" 19.....	"	81	128	1.32	2.00	169
September 11.....	"	65	55	.82	1.14	45

Daily Gauge Height in feet and Discharge in second-feet of Rocky Saugeen River near Markdale for year ending
September 30th, 1919

No. A	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.	Gauge Ht.	Discharge ft.
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	1.33	68	1.29	64	1.33	68	1.75	68	1.42	79	1.46	84	2.75	355	2.00	173	1.75	128	1.46	84	1.25	60	1.25	60
2	1.25	60	1.17	54	1.33	68	2.00	173	1.75	128	1.50	89	2.29	233	2.08	188	1.75	128	1.42	79	1.25	60	1.25	60
3	1.17	54	1.25	60	1.42	79	1.75	128	1.75	128	1.79	135	2.25	224	2.21	215	1.67	115	1.42	79	1.33	68	1.21	57
4	1.17	54	1.46	84	1.33	68	1.58	101	1.67	115	1.83	142	2.25	224	2.50	285	1.67	115	1.46	84	1.29	64	1.25	60
5	1.17	54	1.42	79	1.25	60	1.58	101	1.42	79	1.67	115	2.25	224	2.46	275	1.67	115	1.42	79	1.33	68	1.25	60
6	1.25	60	1.33	68	1.25	60	1.58	101	1.58	101	1.67	115	2.42	264	2.33	242	1.75	128	1.58	101	1.21	57	1.17	54
7	1.42	79	1.42	79	1.42	79	1.42	79	1.42	79	1.50	89	2.37	252	2.29	233	1.75	128	1.42	89	1.25	60	1.17	54
8	1.33	68	1.42	79	1.46	84	1.60	104	1.42	79	2.00	173	2.37	252	2.25	224	1.79	135	1.50	89	1.25	60	1.17	54
9	1.25	60	1.67	115	1.50	89	1.58	101	1.42	79	1.67	115	2.42	264	2.17	207	1.67	115	1.50	89	1.25	60	1.17	54
10	1.25	60	1.71	122	1.33	68	1.62	107	1.58	101	1.67	128	2.50	285	2.08	188	1.67	115	1.50	89	1.23	59	1.17	54
11	1.25	60	1.58	101	1.39	75	1.67	115	1.58	101	1.75	128	2.58	307	2.00	173	1.62	107	1.33	68	1.21	57	1.17	54
12	1.17	54	1.71	122	1.33	68	1.67	115	1.67	115	1.75	128	1.75	128	2.50	285	2.00	173	1.58	101	1.33	68	1.25	60
13	1.25	60	1.28	101	1.37	73	1.58	101	1.83	142	1.75	128	2.42	264	2.00	173	1.67	115	1.33	68	1.21	57	1.25	60
14	1.33	68	1.46	84	2.00	173	1.62	107	1.58	101	1.92	159	2.29	233	2.04	181	1.67	115	1.37	73	1.25	60	1.17	54
15	1.33	68	1.58	101	2.00	173	1.62	107	1.62	107	1.67	135	2.25	224	2.00	173	1.50	89	1.37	73	1.33	68	1.33	68
16	1.25	60	1.50	89	1.96	166	1.58	101	1.54	95	2.08	188	2.33	242	1.92	159	1.58	101	1.42	79	1.33	68	1.25	60
17	1.33	68	1.46	84	2.00	173	1.58	101	1.58	101	2.75	355	2.00	173	1.58	101	1.42	79	1.33	68	1.25	60	1.17	54
18	1.25	60	1.46	84	1.92	159	1.62	107	1.58	101	3.08	450	2.33	242	2.08	188	1.58	101	1.33	68	1.42	79	1.25	60
19	1.08	48	1.67	115	1.83	142	1.58	101	1.83	142	3.00	430	2.25	224	2.00	173	1.62	107	1.33	68	1.42	79	1.21	57
20	1.42	79	1.58	101	1.83	142	1.67	115	1.83	142	3.08	454	2.21	215	2.21	215	1.50	89	1.33	68	1.33	68	1.17	54
21	1.42	79	1.50	89	1.75	128	1.54	95	1.83	142	3.42	555	2.25	224	2.08	188	1.62	107	1.29	64	1.37	73	1.17	54
22	1.42	79	1.58	101	2.00	173	1.58	101	1.54	95	2.92	406	2.17	207	2.25	224	1.50	89	1.42	79	1.33	68	1.42	79
23	1.58	101	1.58	101	2.08	188	1.92	159	1.54	95	2.92	406	2.08	188	2.21	215	1.50	89	1.39	75	1.33	68	1.25	60
24	1.25	60	1.42	79	2.00	173	1.96	166	1.50	89	2.79	367	2.00	173	2.17	207	1.54	95	1.37	73	1.33	68	1.25	60
25	1.17	54	1.40	76	2.00	173	1.54	95	1.58	101	2.79	367	2.00	173	2.08	188	1.58	101	1.25	60	1.25	60	1.25	60
26	1.17	54	1.33	68	1.92	159	1.79	135	1.67	115	2.75	355	2.00	173	2.00	173	1.58	101	1.25	60	1.25	60	1.25	60
27	1.25	60	1.25	60	1.92	159	1.83	142	1.62	107	2.92	406	2.00	173	1.92	159	1.58	101	1.42	79	1.33	68	1.21	57
28	1.33	68	1.29	64	1.83	142	1.67	138	1.50	89	2.83	379	2.17	207	1.83	142	1.58	101	1.33	68	1.33	68	1.17	54
29	1.25	60	1.50	89	1.75	128	1.79	135	1.67	115	2.58	307	2.17	207	1.83	142	1.50	89	1.33	68	1.29	64	1.21	57
30	1.29	65	1.33	68	1.83	142	1.75	128	1.75	128	2.58	307	2.21	215	1.83	142	1.50	89	1.33	68	1.25	60	1.17	54
31	1.25	60	....	....	1.75	128	1.75	128	1.75	128	2.50	....	....	....	....	1.75	128	1.75	128	1.25	60	1.25	60	

Monthly Discharge of Rocky Saugeen River at Markdale for year
ending September 30th, 1919

Drainage Area, 96 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	101	48	64	1.05	.50	.67	.77
November "	122	54	86	1.27	.56	.90	1.00
December "	188	60	121	1.96	.62	1.26	1.45
January (1919)	173	95	118	1.80	.99	1.23	1.42
February	142	79	105	1.48	.82	1.09	1.13
March	555	84	254	5.78	.87	2.65	3.06
April	355	173	233	3.70	1.80	2.43	2.71
May	285	128	191	2.97	1.33	1.99	2.29
June	135	89	107	1.41	.93	1.11	1.24
July	101	60	75	1.05	.62	.78	.90
August	79	57	64	.82	.59	.67	.77
September	79	54	58	.82	.56	.60	.67
The year.....	555	48	123	5.78	.50	1.28	17.44

Saugeen River near Port Elgin

Location—At the highway bridge known as McCalder's Bridge, 4 miles north-east of the Town of Port Elgin, near lot 5, concession 12, Township of Saugeen, County of Bruce.

Records Available—Discharge measurements from July, 1911. Daily gauge heights from April 19, 1914.

Drainage Area—1,565 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment downstream side. Zero of gauge (elevation 4.00) is referred to a B.M. (elevation 25.00) painted on wooden hand-rail of bridge.

Channel and Control—The channel is straight for about 350 feet above and below the section. The bed of the stream, with two submerged piers at the section, is composed of fairly large boulders, which will only shift during high flood stages. The current is moderate and flows through two channels, which are separated by the centre pier of the bridge.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made during the winter to determine the flow.

Regulation—Fluctuations occur in the river stage at this section. This is no doubt caused by the plants at Walkerton, Chesley and Paisley.

Accuracy—Semi-daily reading should give a fair representative mean. The fluctuations that have been noted are not large, consequently the gauge height records can be classified as good. A well-defined curve is shown for flows up to 20,000 sec. feet. A slight angle in cross-section No. 1, may affect accuracy of meter measurements.

Observer—John Shanks, Southampton.

Discharge Measurements of Saugeen River near Port Elgin for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 14.....	Roberts, E.	197	1,004	1.73	6.52	1,736
1919						
January 31.....	"	197	1,420	1.42	8.67	2,011(a)
February 12.....	"	187	1,006	1.07	6.85	1,077(a)
March 19.....	"	221	2,492	5.78	13.46	14,408
" 20.....	"	221	2,270	5.15	12.52	11,680
" 21.....	"	221	2,204	4.89	12.20	10,770
May 18.....	"	197	1,003	1.85	6.54	1,855
September 11.....	"	169	601	.62	4.50	374

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Saugeen River near Port Elgin for year ending
September 30th 1919

Oct.	November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht. Sec.-ft.	Discharge Ht., Sec.-ft.	Gauge Ht., Feet	Discharge Ht., Feet	Gauge Ht., Sec.-ft.	Discharge Ht., Sec.-ft.	Gauge Ht., Feet	Discharge Ht., Feet	Gauge Ht., Sec.-ft.	Discharge Ht., Sec.-ft.	Gauge Ht., Feet	Discharge Ht., Feet	Gauge Ht., Sec.-ft.	Discharge Ht., Sec.-ft.	Gauge Ht., Feet	Discharge Ht., Feet	Gauge Ht., Sec.-ft.	Discharge Ht., Sec.-ft.	Gauge Ht., Feet	Discharge Ht., Feet			
	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot	Foot		
1 5.08	605	5.75	1080	6.21	1450	6.79	1790	8.14	1840	9.54	3870	7.67	2920	6.60	1800	5.75	1080	5.04	580	4.77	412	4.71	376
2 5.04	580	5.77	1100	6.17	1420	6.85	1850	7.60	1360	9.19	3430	7.12	2320	6.64	1840	5.75	1080	4.98	540	4.73	388	4.62	322
3 5.14	580	5.79	1110	6.12	1380	6.96	1960	7.62	1380	8.79	2950	7.08	2280	6.62	1820	5.64	1000	4.87	472	4.67	352	4.58	298
4 5.00	550	5.92	1220	6.04	1310	6.87	1870	7.75	1480	8.58	2710	7.08	2280	9.00	4650	5.58	955	4.79	424	4.62	322	4.69	364
5 5.00	550	6.00	1280	6.00	1280	7.00	2000	7.60	1360	8.58	2710	7.08	2280	9.69	5740	5.50	906	4.73	388	4.62	322	4.58	298
6 5.00	550	6.00	1280	6.00	1050	8.67	2290	7.21	1050	8.67	2810	7.10	2300	9.29	5080	5.54	930	4.79	424	4.58	298	4.58	298
7 5.00	550	6.00	1280	6.21	1450	8.58	3790	7.00	900	8.58	2710	7.46	2690	8.75	4300	5.58	955	5.33	370	4.58	298	4.58	298
8 5.00	550	6.21	1450	6.39	1610	8.00	3080	7.00	900	8.54	2660	7.79	3070	8.17	3520	5.50	900	5.21	695	4.69	364	4.54	274
9 5.17	670	7.37	2590	7.20	2590	7.37	2590	7.85	845	8.00	3010	8.29	3680	7.58	2820	5.58	605	4.62	322	4.50	250	4.50	250
10 5.37	810	7.58	2820	7.37	2820	7.37	2590	7.85	780	7.75	1850	8.54	4010	6.92	2120	5.50	900	4.87	472	4.58	298	4.50	250
11 5.42	845	7.21	2410	7.25	2460	8.46	3640	6.83	780	7.46	1580	9.25	5020	6.58	1780	5.46	870	4.79	424	4.54	274	4.47	232
12 5.29	755	6.83	2030	7.00	2200	8.67	3910	6.83	1060	7.54	1660	9.33	5150	6.54	1750	5.37	810	4.75	400	4.49	244	4.46	226
13 5.21	695	6.50	1710	6.87	2070	8.71	3960	6.83	1060	8.54	2660	9.08	4770	6.50	1710	5.19	685	4.75	400	4.44	214	4.46	226
14 5.21	695	6.42	1640	9.54	5490	8.83	4130	6.87	1100	8.37	2480	8.37	3780	6.33	1560	5.04	580	4.73	388	4.42	202	4.46	226
15 5.17	670	6.29	1520	10.12	6510	8.62	3850	9.33	3600	8.21	2310	7.89	3090	6.29	1520	5.00	550	4.85	448	4.42	202	4.46	226
16 5.17	670	6.21	1450	9.75	5840	8.42	3590	8.96	3150	9.87	6060	8.67	4190	6.17	1420	4.96	525	4.83	448	4.42	202	4.50	250
17 5.12	635	6.00	1280	9.17	4900	8.35	3500	8.54	2660	9.54	18740	8.67	4190	6.33	1560	4.83	448	4.79	424	4.44	214	4.46	226
18 5.08	605	7.12	2320	8.46	3900	8.12	3220	8.10	2200	14.29	17700	8.62	4120	6.54	1750	4.83	448	4.71	376	4.92	500	4.46	226
19 5.08	605	7.67	2920	7.87	3160	8.00	3080	7.77	1870	13.55	15080	8.37	3780	6.71	1910	4.83	448	4.64	334	5.10	620	4.45	220
20 5.08	605	7.37	2890	7.44	2660	7.89	2950	7.39	1520	12.62	12110	7.89	3190	6.62	1820	5.12	635	4.58	298	5.06	590	4.42	202
21 5.37	810	7.12	2320	7.06	2260	7.87	2920	6.96	1170	12.33	11320	7.71	2970	6.81	2010	5.21	695	4.67	352	4.92	500	4.48	238
22 5.71	1050	7.00	2200	9.50	5420	7.73	2760	6.85	1080	12.00	10480	7.37	2590	7.33	2540	5.21	695	4.69	364	4.98	540	5.75	1080
23 5.79	1110	6.89	2090	9.19	4940	8.25	3380	6.83	1060	11.87	10160	7.17	2370	8.62	4120	5.14	650	4.77	412	4.87	472	5.58	955
24 5.77	1100	6.71	1910	9.00	4650	12.60	7600	7.17	1340	11.37	9000	6.96	2160	8.37	3780	5.08	605	4.96	525	4.83	448	4.82	845
25 5.73	1060	6.42	1640	8.50	3690	12.00	6470	7.25	1400	10.21	6670	6.75	1950	7.87	3160	5.00	550	4.87	472	4.79	424	5.12	635
26 5.58	955	6.00	1280	7.33	2330	11.23	5150	7.08	1260	9.87	6060	6.71	1910	7.44	2660	5.08	605	4.81	436	4.75	400	5.08	605
27 5.52	915	6.00	1280	7.00	2000	10.87	4610	6.58	885	10.12	6510	6.60	1800	7.02	2220	5.17	670	4.83	448	4.71	376	5.00	550
28 5.46	870	6.00	1280	7.00	2000	10.33	3860	6.71	975	10.42	7060	6.64	1840	6.87	2070	5.17	670	4.89	484	4.58	298	4.87	472
29 5.58	955	6.04	1310	6.75	1750	9.31	3090	....	....	9.87	6060	6.64	1840	6.62	1820	5.17	670	4.87	472	4.58	298	4.83	448
30 5.75	1080	....	....	6.75	1750	8.67	2370	....	....	8.35	3760	....	....	5.94	1230	....	....	4.81	388	4.73	322	4.79	424
31 5.75	1080	....	....	6.75	1750	8.67	2370	....	....	8.35	3760	....	....	5.94	1230	....	....	4.81	388	4.73	322	4.79	424

Monthly Discharge of Saugeen River near Port Elgin for year
ending September 30th, 1919

Drainage Area, 1,565 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,110	550	766	.71	.35	.49	.56
November "	2,920	1,080	1,722	1.87	.69	1.10	1.23
December "	6,510	1,280	2,841	4.16	.82	1.82	2.10
January (1919)	7,600	1,790	3,409	4.86	1.14	2.18	2.51
February	3,600	780	1,431	2.30	.50	.91	.95
March.....	18,740	1,580	6,124	11.97	1.01	3.91	4.51
April.....	5,150	1,800	3,012	3.29	1.15	1.92	2.14
May	5,740	1,230	2,503	3.67	.79	1.60	1.84
June	1,080	448	735	.69	.29	.47	.52
July	780	298	458	.50	.19	.29	.33
August	620	202	358	.40	.13	.23	.26
September.....	1,080	202	385	.69	.13	.25	.28
The year	18,740	202	1,989	11.97	.13	1.27	17.24

Saugeen River near Walkerton

Location—At the south line bridge, $2\frac{1}{2}$ miles above the Town of Walkerton, near lot 39, concession 2, Township of Brant, County of Bruce.

Records Available—Discharge measurements from June, 1912. Daily gauge heights from March 26, 1914.

Drainage Area—850 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment. Zero of the gauge is 14.00 feet, which is referred to a B.M. (elevation 35.00) on tension rod of bridge.

Channel and Control—Channel is straight for about 500 feet above and below the section. Both banks are high, and do not overflow. The river bed is composed of clay, one channel existing at all stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made to determine the winter flow.

Regulation—The dam above Walkerton, about $1\frac{1}{2}$ miles downstream has no effect on the river stage at this section.

Accuracy—Weeds below this section have a gradually changing effect on the velocity.

Observer—James Preston, Walkerton.

Discharge Measurements of Saugeen River near Walkerton for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 16.....	Roberts, E.....	125	556	1.25	16.19	695
1919						
January 30.....	"....	130	647	1.77	16.92	1,143
February 11.....	"....	123	517	.92	15.92	467 (a)
March 18.....	"....	135	1,728	5.63	25.08	9,725
" 19.....	"....	135	1,512	4.89	23.39	7,388
" 20.....	"....	135	1,448	4.46	22.79	6,453
" 21.....	"....	135	1,485	4.84	23.25	7,186
April 7.....	"....	130	814	2.51	18.17	2,043
May 19.....	"....	127	705	1.83	17.33	1,291
September 11.....	"....	103	389	.56	15.04	217

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Saugeen River near Walkerton for year ending
September 30th, 1919

Octuber	November		December		January		February		March		April		May		June		July		August		September			
	Gauge Ht.	Discharge																						
	Feet	Sec.-ft.																						
1 15.29	306	16.12	680	16.17	705	16.92	1080	16.54	790	16.92	980	18.17	1940	16.79	1020	16.08	660	15.33	322	15.25	290	15.21	274	
2 15.21	274	16.00	620	16.21	725	17.21	1270	16.29	715	17.00	1020	17.54	1500	16.83	1040	15.94	590	15.29	306	15.21	274	15.25	290	
3 15.29	306	15.79	515	16.46	850	17.25	1300	16.58	810	17.12	1080	17.60	1540	17.29	1320	15.87	555	15.33	322	15.10	230	15.21	274	
4 15.17	258	16.19	715	16.33	785	17.12	1080	16.50	770	17.08	1060	17.33	1350	19.00	2620	15.89	565	15.29	306	15.54	406	15.19	266	
5 15.17	258	16.46	850	16.21	725	16.87	955	16.12	580	17.46	1300	17.33	1350	17.37	3790	15.87	555	15.33	322	15.21	274	15.08	222	
6 15.29	306	16.50	870	16.08	660	17.00	1020	16.08	560	17.71	1480	17.67	1590	19.96	3500	16.04	640	15.92	580	15.21	274	15.10	230	
7 15.18	382	16.42	830	16.29	765	17.37	1240	16.21	625	17.58	1390	18.08	1880	18.79	2320	16.00	620	15.32	580	15.29	306	15.10	230	
8 15.54	406	16.42	830	16.25	745	17.04	1040	16.21	625	17.62	1410	18.50	2190	17.96	1790	16.12	680	15.69	466	15.17	258	15.04	206	
9 15.58	422	17.25	1300	16.50	870	16.83	935	16.12	580	17.04	1040	18.87	2500	17.46	1440	16.08	660	15.42	358	15.21	274	15.02	198	
10 15.62	438	17.54	1500	16.46	850	16.46	750	16.04	540	17.12	1080	19.25	2840	17.06	1170	16.04	640	15.42	358	15.08	222	15.04	206	
11 15.58	422	17.37	1380	16.46	850	16.46	750	16.00	520	17.12	1080	20.17	3710	16.94	1090	15.92	580	15.42	358	15.00	190	15.04	206	
12 15.50	390	17.37	1380	16.62	930	16.71	875	15.96	500	16.96	1000	20.37	3910	16.92	1080	15.75	495	15.37	338	14.87	141	15.08	222	
13 15.25	290	16.79	1020	16.60	920	16.92	980	15.98	510	17.46	1440	19.37	2950	16.92	1080	15.67	458	15.25	290	15.12	238	15.00	190	
14 15.29	306	16.33	785	18.54	2220	16.62	830	16.17	605	17.08	1180	18.62	2290	16.79	1200	15.58	422	15.25	290	14.71	93	15.12	238	
15 15.42	358	16.29	765	20.33	3870	16.54	790	16.58	810	17.46	1440	18.04	1850	16.71	975	15.54	406	15.25	306	15.04	206	15.04	206	
16 15.46	374	16.17	705	20.71	4250	16.67	855	16.50	770	18.83	2470	18.04	1850	16.75	995	15.54	406	15.25	290	15.17	258	15.00	190	
17 15.42	358	16.04	640	19.71	3260	16.46	750	16.60	820	21.58	5180	18.79	2430	16.96	1110	15.52	398	15.33	322	15.17	258	15.04	206	
18 15.29	306	16.33	785	18.83	2470	16.42	730	16.46	750	24.75	9200	18.62	2290	17.21	1270	15.50	390	15.27	298	15.58	422	15.12	238	
19 15.27	298	17.17	1240	18.06	1860	16.42	730	16.29	665	23.75	7800	18.62	2290	17.25	1300	15.50	390	15.14	246	15.62	438	15.00	190	
20 15.56	414	17.46	1440	17.67	1590	16.54	790	16.29	665	23.04	6900	18.12	1900	17.37	1380	15.71	475	15.12	238	15.46	374	15.08	222	
21 16.08	660	17.37	1380	17.37	1380	16.37	705	16.08	560	23.29	7200	17.87	1730	17.58	1530	15.83	535	15.04	206	15.46	374	15.08	222	
22 16.33	785	17.00	1130	18.25	2000	16.29	665	16.00	520	22.00	5650	17.58	1530	18.46	2160	15.62	438	15.37	338	15.46	374	15.58	422	
23 16.27	755	16.54	890	19.79	3330	16.75	895	16.04	540	21.04	4580	17.29	1320	19.08	2690	15.54	406	15.37	338	15.21	274	15.60	430	
24 16.12	680	16.42	830	20.04	3580	17.62	410	16.04	540	20.96	4500	17.12	1200	18.92	2530	15.37	338	15.29	306	15.25	290	15.54	406	
25 16.00	620	16.21	725	18.79	2430	17.83	833	15.60	16.17	605	20.71	4250	16.94	1090	18.00	1820	15.46	374	15.21	274	15.33	322	15.31	314
26 15.77	505	16.08	660	17.50	1470	17.71	1480	15.87	458	20.73	4270	16.92	1080	17.67	1590	15.54	406	15.37	338	15.29	306	15.17	258	
27 15.67	458	15.96	600	17.62	1550	16.72	1410	15.79	426	21.25	1300	15.71	475	15.33	306	15.29	306	15.21	274	15.55	290	15.23	282	
28 15.73	485	16.04	640	17.92	1760	17.33	1210	16.27	655	21.04	4580	16.96	1110	16.83	1040	15.62	438	15.42	358	15.27	298	15.10	230	
29 16.08	660	16.17	705	17.37	1380	17.25	1160	17.08	1060	20.62	4160	17.04	1150	16.60	920	15.54	406	15.42	358	15.37	338	15.29	306	
30 16.17	705	16.67	955	17.04	1150	17.37	1380	16.37	705	19.17	2770	17.00	1130	16.33	785	15.42	358	15.37	338	15.29	306	15.21	274	
31 16.21	725	16.87	955	16.92	1080	16.87	955	16.50	2190	18.50	705	16.17	705	15.25	290	15.25	338	15.37	338	15.37	338	15.21	274	

Monthly Discharge of Saugeen River at Walkerton for year ending
September 30th, 1919

Drainage Area, 850 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October .. (1918)	785	258	449	.92	.30	.53	.61
November "	1,500	515	912	1.77	.61	1.07	1.19
December "	4,250	660	1,645	5.00	.77	1.94	2.24
January .. (1919)	1,560	665	1,008	1.84	.78	1.19	1.37
February	820	426	625	.96	.50	.74	.77
March	9,200	980	3,177	10.82	1.15	3.74	4.31
April	3,910	1,060	1,885	4.60	1.25	2.22	2.48
May	3,790	705	1,564	4.46	.83	1.84	2.12
June	680	338	492	.80	.40	.58	.65
July	580	206	334	.68	.24	.39	.45
August	438	93	287	.52	.11	.34	.39
September	430	190	254	.51	.22	.30	.30
The year	9,200	93	1,058	10.82	.11	1.24	16.90

Sydenham River near Owen Sound

Location—At the highway bridge above the Town of Owen Sound's filtration plant, near lot 9, concession 1, Township of Derby, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 9, 1915.

Drainage Area—71 square miles.

Gauge—Vertical staff 0 to 6 feet on upstream side of first pier from right abutment. Zero on the gauge is 0.00.

Channel and Control—The channel is straight for 200 feet above and below the section. Both banks are low, but do not overflow, the stream never assuming flood proportions. The bed is composed of solid rock, with two channels during the low-water period. During the high-water stages all the water is confined between the two abutments of the bridge.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 30 feet upstream during the low stages.

Winter Flow—Ice has little effect.

Regulation—The Town of Owen Sound has a dam 300 feet above this section that is used to supply water for domestic uses.

Diversions—An additional 750,000 gallons of water per day should be added to the daily flow at this section, which is the approximate amount diverted.

Accuracy—There are not sufficient readings to define a curve at all stages. Discharges between gauge heights .90 and 2.00 are fair.

Observer—Myrtle McClintock, Owen Sound.

Discharge Measurements of Sydenham River near Owen Sound for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 14.....	Roberts, E.....	53	40	1.50	1.25	60
Dec. 9.....	"	54	41	1.83	1.39	75
1919						
Jan. 4.....	"	53	49	1.75	1.54	86 (a)
Feb. 1.....	"	48	51	2.59	1.62	142
" 26.....	"	49	35	1.49	1.29	52 (a)
Mar. 4.....	"	62	73	2.58	1.79	189
Apr. 4.....	"	63	64	2.61	1.71	168
May 17.....	"	55	51	1.86	1.50	95
Sept. 10.....	"	37	15	.75	.83	11

(a) Ice measurement.

TWELFTH ANNUAL REPORT OF THE

Daily Gauge Height in feet and Discharge in second-feet of Sydenham River near Owen Sound for year ending September 30th, 1919

October	November		December		January		February		March		April		May		June		July		August		September							
	Gauge Ht.	Discharge																										
	Feet	Sec- <i>ft.</i>																										
1	.92	19	.92	19	1.04	30	1.25	56	1.42	87	1.50	105	1.46	96	1.67	122	1.67	122	1.75	146	1.75	146	1.62	136	1.42	87		
2	.92	19	.92	19	1.04	30	1.29	62	1.46	96	1.46	96	1.42	87	1.42	87	1.58	125	1.50	105	1.67	152	1.50	105	1.17	45	.92	19
3	.92	19	.92	19	1.08	34	1.29	62	1.46	96	1.46	96	1.42	87	1.42	87	1.58	125	1.67	152	1.67	152	1.75	139	.92	19	.87	15
4	.92	19	.92	19	1.17	45	1.25	56	1.50	83	1.50	83	1.42	87	1.42	87	1.71	133	1.58	125	1.92	255	1.08	34	.92	19	.87	15
5	.96	22	.96	22	1.17	45	1.25	56	1.54	92	1.42	87	1.42	87	1.71	133	1.58	125	1.92	255	1.17	45	1.92	19	.92	19	.83	12
6	.96	22	1.00	26	1.17	45	1.21	50	1.46	75	1.42	87	1.42	87	1.71	133	1.58	125	1.92	255	1.17	45	1.92	19	.92	19	.83	12
7	.96	22	1.00	26	1.17	39	1.21	50	1.46	75	1.33	70	1.75	146	1.67	152	1.75	180	1.21	50	1.92	19	.92	19	.87	15		
8	.96	22	1.00	26	1.17	45	1.25	56	1.42	75	1.33	70	1.67	122	1.62	136	1.67	152	1.25	56	1.92	19	.92	19	.83	12		
9	.96	22	1.00	26	1.17	45	1.25	56	1.42	75	1.33	70	1.50	83	1.71	166	1.58	125	1.25	56	1.92	19	.92	19	.83	12		
10	.96	22	1.00	26	1.17	45	1.25	56	1.42	77	1.33	70	1.50	83	1.75	180	1.54	115	1.17	45	1.92	19	.92	19	.83	12		
11	.96	22	1.00	26	1.17	45	1.25	56	1.42	77	1.33	70	1.50	83	1.83	212	1.50	105	1.12	39	1.92	19	.92	19	.83	12		
12	.96	22	1.00	26	1.17	39	1.21	50	1.42	77	1.33	70	1.50	83	1.83	212	1.50	105	1.08	34	1.92	19	.92	19	.83	12		
13	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.50	83	1.83	212	1.50	105	1.08	34	1.92	19	.92	19	.83	12		
14	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.67	122	1.75	180	1.50	105	1.08	34	1.92	19	.92	19	.87	15		
15	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	146	1.67	152	1.50	105	1.00	26	1.92	19	.92	19	.87	15		
16	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	146	1.67	152	1.50	105	1.04	30	1.92	19	.92	19	.83	12		
17	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	146	1.67	152	1.42	87	1.04	30	1.92	19	.92	19	.83	12		
18	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
19	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
20	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
21	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
22	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
23	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
24	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
25	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
26	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
27	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
28	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
29	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
30	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		
31	.96	22	1.00	26	1.17	45	1.25	56	1.42	87	1.33	70	1.75	1070	1.75	180	1.42	87	1.00	26	1.92	19	.92	19	.83	12		

Monthly Discharge of Sydenham River at Owen Sound for year
ending September 30th, 1919

Drainage Area, 71 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ..(1918)	34	19	24	.48	.27	.34	.39
November "	115	30	64	1.62	.42	.90	1.00
December "	297	50	135	4.19	.70	1.90	2.19
January .. (1919)	212	60	99	2.99	.85	1.39	1.60
February	152	48	73	2.14	.68	1.03	1.07
March	1,120	83	287	15.77	1.17	4.04	4.66
April	212	96	148	2.99	1.35	2.08	2.32
May	255	56	110	3.59	.79	1.55	1.79
June.....	56	22	33	.79	.31	.46	.51
July	26	19	20	.37	.27	.28	.32
August	22	12	16	.31	.17	.23	.26
September	34	12	15	.48	.17	.21	.23
The year	1,120	12	86	15.77	.17	1.21	16.37

Thames River (Main Stream) at Kilworth

Location—At the highway bridge known as Kilworth Bridge, 2 miles north-west of the Town of Byron, near the Village of Komoka, Township of Delaware, County of Middlesex.

Records Available—Monthly discharge measurements from March, 1912. Daily gauge heights from March 13, 1914.

Drainage Area—1,270 square miles.

Gauge—Vertical staff 0 to 12 feet on centre pier. The zero of gauge (elevation 6.00), which has remained unchanged since established, is referred to a B.M. (elevation 31.21) on downstream side of right abutment.

Channel and Control—The channel is straight above and below section for about 600 feet. The banks are high, and do not overflow or shift to a great extent. The control, however, is not stationary under high-water conditions. The velocity is high.

Discharge Measurements—Made from bridge at all stages.

Winter Flow—Ice is present during the winter period, and measurements are made to determine the winter flow. Relation of flow to gauge altogether disturbed during spring flood, while ice is present.

Accuracy—During flood stages the high velocity necessitates the taking of surface readings. The station rating curve is fairly well defined for ordinary flows.

Observer—James Bourne, Komoka.

Discharge Measurements of Thames River (Main Stream) at Kilworth for year ending September 30th 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 28.....	Roberts, E.....	206	248	1.63	6.71	404
December 12.....	".....	211	391	3.19	7.42	1,258
1919						
January 24.....	".....	241	1,110	5.32	10.50	5,906
February 14.....	".....	221	279	2.49	6.98	694
May 29.....	".....	206	320	2.96	7.21	947
September 15.....	".....	184	152	.78	6.24	119

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Thames River (Main Stream) at Kilworth for year ending
September 30th, 1919

Month	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.	Discharge																																		
	Feet	Sec.-ft.																																		
1	6.50	225	6.75	475	6.92	655	7.12	875	7.12	9.12	3460	7.08	835	7.08	835	6.92	655	6.92	655	6.42	145	6.42	145	6.37	95	6.33	55	6.33	55	55	6.33	55				
2	6.50	225	6.67	395	6.75	475	6.83	560	8.17	2140	6.92	655	9.04	3340	7.08	835	7.12	2290	7.04	790	7.21	975	6.87	600	6.42	145	6.42	145	6.33	55	6.33	55				
3	6.50	225	6.75	475	6.83	560	7.00	930	7.17	7.00	1970	7.00	745	8.92	3160	6.83	560	6.50	225	6.29	22	6.42	145	6.42	145	6.42	145	6.42	145	6.42	145					
4	6.58	305	6.79	515	6.79	515	7.17	655	7.17	515	8.12	1770	7.04	790	12.79	11040	6.92	655	6.42	145	6.25	12	6.42	145	6.42	145	6.42	145	6.42	145	6.42	145				
5	6.58	305	6.83	560	6.83	560	6.92	655	6.92	655	7.21	1830	7.29	1070	11.21	730	7.00	745	6.42	145	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55	6.33	55				
6	6.58	305	6.83	560	6.79	515	7.21	655	7.21	6.75	475	7.92	1830	7.29	1070	11.21	730	7.00	745	6.42	145	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55					
7	6.54	265	6.79	515	6.71	435	7.42	1230	7.04	790	7.37	1170	7.96	1880	9.46	3390	6.96	700	6.42	145	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55						
8	6.46	185	6.75	475	6.83	560	7.17	830	6.79	515	7.33	1120	8.33	2340	8.62	2730	6.92	655	6.42	145	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55						
9	6.46	185	6.75	475	6.92	655	8.04	595	6.75	475	7.33	1120	8.92	3160	8.08	2020	6.83	560	6.33	55	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55						
10	6.50	225	6.83	560	7.33	1120	8.67	486	6.79	515	7.25	1020	9.75	4480	7.79	1670	6.83	560	6.33	55	6.25	12	6.33	55	6.33	55	6.33	55	6.33	55						
11	6.50	225	7.04	790	7.25	1020	9.33	434	6.83	560	8.12	2070	11.62	8180	7.67	1530	6.83	560	6.33	55	6.25	12	6.25	12	6.25	12	6.25	12	6.25	12						
12	6.46	185	7.00	745	7.33	1120	9.37	460	6.75	475	8.67	2800	10.25	5380	7.75	1620	6.75	475	6.33	55	6.25	12	6.25	12	6.25	12	6.25	12	6.25	12						
13	6.46	185	6.92	655	7.46	1280	9.04	460	6.71	435	10.67	1180	9.25	3660	7.75	1620	6.71	435	6.33	55	6.25	12	6.25	12	6.25	12	6.25	12	6.25	12						
14	6.46	185	6.83	560	10.79	6420	8.96	412	6.92	655	9.00	3280	8.58	2680	7.42	1230	6.62	345	6.33	55	6.25	12	6.25	12	6.25	12	6.25	12	6.25	12						
15	6.42	145	6.75	475	12.21	9550	8.83	480	8.04	1970	8.87	3080	8.04	1970	7.25	1020	6.50	225	6.37	55	6.29	22	6.25	12	6.25	12	6.25	12	6.25	12						
16	6.33	55	6.75	475	10.17	5230	8.67	460	7.37	1170	11.50	7920	9.08	3400	8.12	2070	6.50	225	6.42	145	6.33	55	6.25	12	6.25	12	6.25	12	6.25	12						
17	6.37	95	6.75	475	9.17	3530	8.54	520	6.96	700	14.75	16860	10.29	5450	10.29	5450	6.58	305	6.37	95	6.42	145	6.25	12	6.25	12	6.25	12	6.25	12						
18	6.46	185	6.75	475	9.17	3530	8.54	520	7.00	745	14.21	15130	10.08	5070	10.25	5070	6.58	305	6.33	95	6.42	145	6.25	12	6.25	12	6.25	12	6.25	12						
19	6.42	145	6.79	515	7.87	1770	7.87	640	7.29	1070	11.50	7920	8.96	3220	9.12	3460	6.50	225	6.33	55	6.42	145	6.25	12	6.25	12	6.25	12	6.25	12						
20	6.50	225	7.00	745	7.58	1420	7.42	625	6.75	475	10.21	5300	8.25	2240	8.62	2730	6.58	305	6.33	55	6.42	145	6.33	55	6.33	55	6.33	55	6.33	55						
21	6.54	265	6.96	700	7.42	1230	7.17	830	6.79	515	9.79	4550	8.04	1970	9.71	4410	6.67	395	6.33	55	6.50	225	6.46	185	6.46	225	6.46	185	6.46	225	6.46					
22	6.67	395	6.92	655	7.92	1830	7.17	830	6.87	600	9.21	3590	7.75	1620	9.58	4190	6.62	345	6.25	12	6.42	145	6.67	395	6.67	395	6.67	395	6.67	395						
23	6.67	395	6.92	655	10.08	5070	7.50	1320	7.75	1620	8.54	2620	7.37	1170	9.46	3990	6.54	265	6.33	55	6.42	145	6.75	475	6.75	475	6.75	475	6.75	475						
24	6.58	305	6.83	560	9.04	3340	10.42	5690	7.83	1720	8.12	2070	7.33	1120	9.25	3660	6.54	265	6.42	145	6.37	95	6.67	395	6.67	395	6.67	395	6.67	395						
25	6.50	225	6.75	475	8.33	2340	9.25	3660	7.79	1670	8.04	1970	7.58	1420	8.75	2920	6.58	305	6.42	145	6.33	55	6.58	305	6.58	305	6.58	305	6.58	305						
26	6.54	265	6.75	475	475	1770	8.87	3080	7.46	1280	8.00	2420	7.37	1170	8.12	2070	7.68	305	6.37	95	6.33	55	6.33	55	6.33	55	6.33	55	6.33	55						
27	6.50	225	6.75	475	7.42	1230	8.25	2240	6.71	435	8.42	2460	7.25	1020	7.67	1530	6.58	305	6.33	55	6.42	145	6.42	145	6.42	145	6.42	145	6.42	145						
28	6.54	265	6.71	435	7.54	835	7.08	8.08	2020	7.25	1020	7.08	835	6.50	225	6.25	145	6.46	185	6.29	22	6.33	55	6.33	55	6.33	55	6.33	55							
29	6.71	435	6.71	435	7.54	835	7.08	8.08	2020	7.25	1020	7.08	835	6.50	225	6.25	145	6.46	185	6.29	22	6.33	55	6.33	55	6.33	55	6.33	55							
30	6.83	560	6.75	475	7.37	1170	7.00	745	7.37	1170	7.00	745	7.17	930	7.00	745	7.00	745	7.00	745	7.00	745	7.00	745	7.00	745	7.00	745								
31	6.75	475	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04							

Note.—Winter flow estimates (January 9th to 20th incl.), based on flow of north branch near Fanshaw.

Monthly Discharge of Thames River (Main Stream) at Kilworth for year
ending September 30th, 1919

Drainage Area, 1,270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	560	55	255	.44	.04	.20	.23
November	790	395	542	.62	.31	.43	.48
December	9,550	435	1,939	7.52	.34	1.53	1.76
January (1919)	5,690	412	1,269	4.48	.32	1.00	1.15
February	1,970	435	835	1.55	.34	.66	.69
March	16,860	1,020	3,769	13.28	.80	2.97	3.42
April	8,180	745	2,353	6.44	.59	1.85	2.06
May	11,040	745	2,806	8.69	.59	2.21	2.55
June	745	185	422	.59	.15	.33	.37
July	225	12	91	.18	.01	.07	.08
August	225	12	69	.18	.01	.05	.06
September	475	12	106	.37	.01	.08	.09
The year	16,860	12	1,211	13.28	.01	.95	12.94

Thames River (North Branch) near Fanshawe

Location—At the highway bridge near Fanshawe Post Office, between lots 8 and 9, concession 4 and 5, Township of London, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 13, 1915.

Drainage Area—585 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment, downstream side. Elevation of zero of gauge 4.00 is referred to a B.M. (elevation 30.00) on tension rod, downstream side, 170 feet from the initial point of soundings.

Channel and Control—The channel is straight above and below section for 500 feet. The bed of the stream is composed of clay and gravel, the banks are high and will not overflow. The channel and control is shifting during high-water periods.

Discharge Measurements—Made from the bridge and at a permanent wading section about 500 feet above during low water.

Accuracy—This curve is fairly well defined.

Observer—R. C. Bradley, London.

Discharge Measurements of Thames River (North Branch) near Fanshawe for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
December 12.....	Roberts, E.....	171	441	1.55	7.71	682
1919						
January 11.....	"	65	208	.93	6.60	192(a)
" 24.....	"	171	1,145	3.83	10.17	4,381(a)
" 24.....	"	171	1,077	3.33	9.79	3,584(a)
February 14.....	"	171	434	.45	6.42	194(a)
March 25.....	"	171	735	1.18	7.75	867
May 28.....	"	97	141	3.32	7.08	469
June 6.....	"	70	95	1.74	6.08	165
" 6.....	"	71	114	2.12	6.46	242
July 24.....	"	55	34	1.73	5.64	58
August 2.....	"	26	17	1.51	5.25	26
September 15.....	Yeates, W.....	40	20	1.16	5.25	23

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Thames River (North Branch) near Fanshawe
for year ending September 30th, 1919

		October		November		December		January		February		March		April		May		June		July		August		September		
Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	
Sec- <i>ft.</i>	Sec- <i>ft.</i>	Feet	Sec- <i>ft.</i>																							
1	5.73	27	6.04	32	6.44	73	7.02	368	7.37	468	9.46	2870	6.50	260	6.87	388	6.33	209	5.50	48	5.29	25	5.21	19	19	
2	5.87	29	5.96	30	6.29	49	8.56	1390	7.21	404	8.62	1560	6.73	323	7.02	448	6.29	198	5.33	29	5.25	22	5.12	13	13	
3	5.79	28	5.98	30	6.29	49	8.04	930	7.12	368	8.21	1150	6.73	353	9.08	2370	6.21	178	5.33	29	5.29	25	5.37	33	33	
4	5.73	27	5.87	29	6.33	54	7.52	590	6.96	309	8.08	1040	6.62	296	11.00	5880	6.04	140	5.33	29	5.21	19	5.25	22	22	
5	5.75	28	5.75	29	6.35	58	7.02	368	6.77	251	8.50	1430	6.58	284	9.29	2740	6.17	169	5.25	22	5.25	22	5.25	22	22	
6	5.73	27	5.79	28	6.33	54	7.58	630	6.92	296	7.83	850	7.12	490	8.54	1590	6.37	221	5.29	25	5.25	22	5.25	22	19	
7	5.79	28	5.98	30	6.44	73	7.33	495	6.87	281	7.04	1010	7.83	925	8.02	1080	6.37	221	5.29	25	5.25	22	5.21	22	19	
8	5.73	27	6.04	32	6.54	95	7.10	400	6.64	212	7.50	640	7.96	1030	7.73	850	6.12	157	5.37	33	5.21	19	5.17	16	16	
9	5.67	27	6.00	30	6.73	144	6.75	275	6.37	146	7.42	590	8.29	1320	7.56	735	6.25	188	5.29	25	5.21	19	5.04	8	8	
10	5.73	27	6.04	32	6.44	73	7.02	322	6.96	216	6.58	225	6.27	126	7.10	440	9.08	2370	7.44	665	6.33	209	5.29	25	5.21	19
11	5.60	26	5.96	30	6.42	438	6.60	200	6.14	100	7.37	565	10.42	4780	7.35	610	6.12	157	5.25	22	5.21	19	5.17	16	16	
12	5.54	25	5.94	29	6.76	650	6.64	212	6.29	130	7.58	690	9.12	2440	7.37	620	6.00	132	5.25	22	5.17	16	5.00	6	6	
13	5.48	25	6.04	32	6.54	95	7.10	400	6.64	212	6.31	134	9.37	2710	8.58	1640	7.35	610	5.87	106	5.21	22	5.08	11	11	
14	5.42	24	6.31	32	7.11	52	11.54	6870	6.56	190	6.67	221	7.87	880	7.85	940	7.12	490	5.87	106	5.21	19	5.25	22	5.21	
15	5.33	23	6.31	23	6.31	52	11.54	5840	6.67	221	8.79	1530	7.25	505	8.85	2000	7.00	440	5.75	84	5.25	22	5.25	22	5.21	
16	5.58	26	6.27	47	9.39	2920	6.64	212	7.42	540	9.54	3010	9.79	3640	7.85	940	5.58	59	5.37	33	5.25	22	5.29	25	25	
17	5.71	27	6.23	43	8.64	1710	6.73	239	7.33	495	... ..	... ..	8.96	2180	8.92	2110	5.75	84	5.37	33	5.33	29	5.25	22	22
18	5.73	27	6.27	47	8.25	1280	6.73	239	7.12	408	... ..	... ..	8.50	1540	8.71	1800	5.67	72	5.29	25	5.25	22	5.37	33	29
19	5.79	28	6.33	54	7.85	940	6.92	296	6.75	275	... ..	... ..	8.56	1610	8.44	1470	5.58	72	5.25	22	5.37	33	5.33	29	29
20	5.81	28	6.67	128	7.60	760	6.89	287	6.54	212	... ..	... ..	8.37	1400	7.77	880	5.62	65	5.21	19	5.46	43	5.42	38	38
21	5.85	28	7.04	246	7.48	690	6.83	269	6.54	212	... ..	... ..	8.15	1180	8.73	1940	5.58	59	5.17	16	5.62	65	5.62	59	59
22	5.89	29	6.98	223	8.58	1640	6.77	251	6.58	224	... ..	... ..	7.92	995	8.73	1830	5.58	59	5.08	11	5.50	48	5.58	59	59
23	5.92	29	6.79	162	9.08	2370	7.56	560	7.37	515	... ..	... ..	7.50	700	8.54	1590	5.54	54	5.37	33	5.50	48	5.83	98	98
24	5.85	28	6.64	120	8.54	1590	9.32	3340	7.35	505	... ..	... ..	7.98	690	8.31	1340	5.67	72	5.58	59	5.42	38	5.42	38	38
25	5.87	28	6.50	85	8.12	1080	8.83	1580	7.67	680	7.75	865	7.54	725	8.19	1220	5.62	65	5.29	25	5.37	33	5.33	29	29	
26	5.98	30	6.29	49	7.77	810	8.62	1350	7.29	476	7.73	605	7.34	670	7.42	650	48	5.33	29	5.42	38	5.33	29	29		
27	5.94	29	6.23	43	7.54	665	8.29	1050	6.50	200	8.25	1280	7.08	472	7.50	700	5.71	54	5.54	54	5.42	22	5.42	38	38	
28	5.90	29	6.25	45	7.27	515	8.00	830	7.12	408	8.17	1200	7.04	456	7.08	470	5.71	54	5.25	22	5.42	38	5.33	29	29	
29	5.85	28	6.33	54	6.98	392	7.71	645	... ..	... ..	7.50	700	6.96	424	6.96	424	5.46	43	5.08	11	5.25	22	5.33	29	29
30	5.96	30	6.42	69	6.89	356	7.42	490	... ..	... ..	7.29	575	6.83	372	6.75	341	5.37	33	5.25	22	5.25	22	5.25	22	22
31	6.12	36	6.83	7.33	452	7.12	490	6.54	272	5.33	29	5.21	19	5.21

Monthly Discharge of Thames River (North Branch) near Fanshawe for
year ending September 30th, 1919

Drainage Area, 585 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918).	36	23	28	.06	.04	.05	.06
November "	246	29	64	.42	.05	.11	.12
December "	6,870	49	1,079	11.74	.08	1.84	2.12
January (1919).	3,340	190	606	5.71	.32	1.04	1.20
February	1,530	100	362	2.62	.17	.62	.65
March	3,010	440	1,126	5.15	.75	1.92	2.21
April	4,780	260	1,214	8.17	.44	2.08	2.32
May	5,880	272	1,209	10.05	.46	2.07	2.39
June	221	33	113	.38	.06	.19	.21
July	59	11	26	.10	.02	.04	.05
August	65	13	28	.11	.02	.05	.06
September	98	2	26	.17	.003	.04	.04
The year	6,870	2	517	11.74	.003	.88	11.99

Thames River (South Branch) near Ealing

Location—At the highway bridge known as Vauxhall Bridge between lots 10 and 11, concession B, between Townships of London and Westminster, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 11, 1915.

Drainage Area—515 square miles.

Gauge—Vertical staff 0 to 12 feet on downstream side of first right pier. Elevation of zero of gauge is 4.00, referred to B.M., elevation 30.00.

Channel and Control—The channel is straight above and below for 800 feet. The banks and control are shifting under high-water conditions.

Discharge Measurements—Made from the bridge. During the extreme low water a wading section is used.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months.

Accuracy—The rating curve is fairly well defined up to gauge height 11.00 feet.

Observer—Edna Leathorn, London.

Discharge Measurements of Thames River (South Branch) near Ealing for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 28.....	Roberts, E.....	145	176	.75	6.21	132
Dec. 12.....	"	159	280	1.33	6.85	372
1919						
Feb. 14.....	"	164	229	1.07	6.56	245(a)
July 24.....	"	66	76	1.01	5.92	78
Sept. 15.....	Yeates, W.....	63	63	.66	5.73	41

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Thames River (South Branch) near Ealing for year ending
September 30th, 1919

No.	October	November	December	January		February		March		April		May		June		July		August		September		
				Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht., Feet	Dis-charge Sec.-ft.															
1	6.08	110	6.42	195	6.35	172	6.96	324	6.73	412	8.67	1190	6.90	345	7.02	388	6.60	245	5.98	86	5.85	60
2	6.13	122	6.33	172	6.40	190	8.17	1220	6.63	356	8.31	990	6.85	328	7.13	432	6.56	233	5.88	66	5.88	66
3	6.17	132	6.29	162	6.46	205	8.04	820	6.67	324	7.73	685	6.77	300	7.10	420	6.58	239	5.96	82	5.90	70
4	6.19	138	6.23	148	6.40	190	9.08	520	6.63	272	7.44	555	6.77	300	8.48	1080	6.50	215	5.98	86	5.77	44
5	6.06	105	6.29	162	6.26	162	9.08	324	6.81	221	7.27	488	6.96	366	11.15	3220	6.48	210	5.94	78	5.94	78
6	6.15	128	6.40	190	6.38	185	8.42	455	6.96	260	7.00	380	7.04	396	10.85	290	6.44	200	5.98	86	5.81	52
7	6.08	110	6.33	172	6.31	168	8.42	436	7.00	247	6.88	338	7.85	745	9.21	1530	6.42	195	6.00	90	5.81	52
8	6.13	122	6.27	158	6.46	205	8.21	352	7.83	187	6.81	314	8.31	990	8.44	1060	6.35	178	6.04	100	5.79	48
9	6.08	110	6.29	162	6.79	306	8.50	242	6.40	128	6.96	366	8.98	1350	7.92	780	6.35	178	5.94	78	5.79	48
10	6.06	105	6.42	195	6.88	338	8.38	198	6.33	111	6.75	520	9.29	1580	6.31	555	6.31	74	5.77	44	5.81	52
11	6.04	100	6.42	195	6.92	352	8.33	176	6.38	88	8.08	865	8.00	865	10.15	2260	7.75	695	6.25	152	5.90	70
12	6.06	105	6.48	210	6.85	328	8.29	187	6.42	114	9.00	1390	9.58	1800	8.00	820	6.27	158	5.88	66	5.77	44
13	6.04	100	6.46	205	6.90	345	8.17	187	6.33	118	9.75	1920	8.83	1280	7.79	715	6.27	158	5.81	66	5.79	48
14	5.94	78	6.33	172	8.54	1120	8.08	167	6.52	194	8.27	970	8.25	960	7.48	570	6.25	152	5.81	52	5.79	48
15	6.02	95	6.27	158	9.65	1850	8.08	194	7.06	1350	7.83	735	7.79	715	7.33	510	6.13	122	5.96	82	5.75	40
16	5.92	74	6.23	148	9.29	1580	8.00	187	6.81	475	11.00	3050	9.25	1560	8.42	1050	6.04	100	5.92	74	5.83	56
17	5.92	74	6.21	142	8.42	1050	8.00	210	6.63	436	12.73	5200	10.67	2720	10.17	2270	6.11	118	5.88	66	5.83	56
18	6.04	100	6.25	152	7.83	735	8.19	210	6.60	359	12.25	4540	9.85	2000	10.04	2160	6.11	118	5.88	66	5.79	48
19	6.02	95	6.44	200	7.46	565	8.27	970	6.46	242	10.54	2610	10.63	1170	9.00	1390	6.08	110	5.83	56	5.94	78
20	6.10	115	6.54	227	7.19	456	8.25	253	6.50	187	9.13	1470	8.04	840	8.56	1110	6.83	320	5.75	40	5.96	82
21	6.21	142	6.46	205	7.08	412	8.31	237	6.38	187	8.79	1260	7.88	760	9.29	1580	6.38	185	5.75	40	5.98	86
22	6.35	178	6.38	185	7.52	590	8.38	220	6.33	197	8.40	1040	7.54	600	9.23	1540	6.21	142	5.98	86	5.90	227
23	6.29	162	6.38	185	8.67	1190	8.58	493	8.25	463	8.02	830	7.29	496	9.17	1500	6.08	110	5.94	78	5.94	78
24	6.13	122	6.25	152	8.27	970	8.96	2940	7.96	444	7.83	735	7.35	520	8.71	1210	6.13	122	5.88	66	5.83	56
25	6.13	122	6.31	168	7.90	770	8.58	1390	8.38	600	7.73	685	7.35	520	8.23	945	6.13	122	5.83	56	5.77	44
26	6.13	122	6.21	142	7.54	600	7.81	1190	7.54	419	7.71	675	7.17	448	7.88	760	6.08	110	5.83	56	5.88	66
27	6.08	112	6.17	132	7.29	496	6.67	925	8.46	176	7.19	925	7.04	396	7.63	132	5.75	40	5.88	66	5.98	86
28	6.17	132	6.19	138	7.13	434	7.33	730	7.96	359	8.23	945	7.04	396	7.17	448	6.04	100	5.77	44	5.88	66
29	6.67	266	6.35	178	7.06	404	7.08	570	7.79	715	7.21	464	7.04	396	6.06	105	5.83	56	5.92	74	5.85	60
30	6.71	278	6.50	215	7.88	760	7.04	431	7.35	520	7.04	396	6.96	366	5.88	66	5.75	40	5.88	66	6.04	100
31	6.52	221	.....	.....	8.42	1050	6.98	398	7.15	440	7.15	440	6.79	398	6.79	398	6.79	398	5.85	60	5.85	60

Note.—Winter flow estimates (January and February), based on flow of north branch near Farnshawe.

Monthly Discharge of Thames River (South Branch) near Ealing for
year ending September 30th, 1919,

Drainage Area, 515 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October... (1918)	278	74	128	.54	.14	.25	.29
November "	227	132	174	.44	.26	.34	.38
December "	1,850	162	586	3.59	.31	1.14	1.31
January .. (1919)	2,940	167	534	5.71	.32	1.04	1.20
February	1,350	88	318	2.62	.17	.62	.65
March	5,200	314	1,205	10.09	.61	2.34	2.70
April	2,720	300	900	5.28	.58	1.75	1.95
May	3,220	308	1,079	6.25	.60	2.10	2.42
June	320	66	159	.62	.13	.31	.35
July	100	40	67	.19	.08	.13	.15
August	90	32	63	.17	.06	.12	.14
September	239	32	77	.46	.06	.15	.17
The year	5,200	32	443	10.09	.06	.86	11.67

Regular Stations

SOUTH-WESTERN ONTARIO DISTRICT

Grand River and Tributaries

River	Location	Drainage Area Sq. Miles	Township	County
Grand.....	at Belwood	280	West Garafraxa	Wellington
".....	at Brantford.....	2,000	Brantford	Brant
".....	near Conestogo.....	550	Woolwich.....	Waterloo
".....	at Galt.....	1,360	North Dumfries.....	"
".....	at Glen Morris.....	1,390	South Dumfries.....	Brant
".....	at York	2,280	Oneida	Haldimand
Speed	at Hespeler.....	250	Waterloo	Waterloo

Grand River at Belwood

Location—At the bridge in the Village of Belwood, on the 7th concession, Township of West Garafraxa, County of Wellington.

Records Available—From August 31, 1913.

Drainage Area—280 square miles.

Gauge—Vertical steel staff 0 to 12 feet on right abutment. Elevation of zero of gauge is 1366.00, which has remained unchanged since established.

Channel and Control—The channel is straight for about 400 feet above and 600 feet below gauging section. The channel bed at the bridge is solid rock, and permanent at all stages. At the permanent low water section, however, the channel is shifting under high water conditions.

Winter Flow—During the winter months the relation of gauge height to discharge is greatly affected by ice, and readings are taken to determine the winter discharge.

Accuracy—The river stage at this section is not affected by any power plants above or below. The rating curve is well defined, and estimates are considered good.

Observer—H. Hutchinson, Belwood P.O.

Discharge Measurements of Grand River at Belwood for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 23.....	Roberts, E.....	76	77	2.10	1367.62	162
1919						
February 18.....	".....	70	47	1.59	1367.83	74 (a)
March 26.....	".....	110	690	2.80	1370.15	1,930
May 25.....	".....	110	522	1.27	1368.60	663
September 17.....	".....	20	6	.80	1366.83	4.8

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Grand River at Belwood for year ending September, 30th, 1919

Monthly Discharge of Grand River at Belwood for year ending
September 30th, 1919

Drainage Area, 280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	493	35	134	1.76	.12	.48	.55
November "	640	68	235	2.29	.24	.84	.94
December "	2,390	180	607	8.53	.64	2.17	2.50
January (1919)	570	176	311	2.04	.63	1.11	1.28
February	264	32	92	.94	.11	.33	.34
March	4,060	218	954	14.50	.78	3.41	3.93
April	2,800	162	701	10.00	.58	2.50	2.79
May	2,540	92	573	9.07	.32	2.05	2.36
June	218	19	63	.78	.07	.22	.24
July	19	6	10	.07	.02	.04	.05
August	23	4	9	.08	.01	.03	.04
September	23	6	9	.08	.02	.03	.03
The year	4,060	4	311	14.50	.01	1.11	15.07

Grand River at Brantford

Location—At the Toronto-Hamilton-Buffalo Railway bridge in the City of Brantford, County of Brant.

Records Available—Discharge measurements from August, 1912. Daily gauge heights from July 8, 1913.

Drainage Area—2,000 square miles.

Gauge—Vertical steel staff, 0 to 12 feet on left abutment. Elevation of zero of gauge is 643.00, which has remained unchanged since established.

Channel and Control—The flow is confined between the abutments of the bridge at all stages. The bed and left bank is shifting under high water conditions.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—During the low water stage serious fluctuations are noticeable at this location. The observed mean gauge height does not always give the correct mean daily stage.

Accuracy—A slight angle at section, which changes with changes in stage, affects these records.

Observer—John Anguish, Brantford.

Discharge Measurements of Grand River at Brantford for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 27.....	Roberts, E.....	281	1,041	.83	645.00	867
1919						
January 13.....	"	93	622	1.24	645.42	769(a)
February 15.....	"	281	1,016	.92	645.00	967(a)
March 10.....	"	281	1,216	1.50	645.71	1,830
April 15.....	"	281	1,482	2.34	646.64	3,461
June 5.....	"	278	982	.95	644.87	932
" 6.....	"	278	1,010	1.00	645.00	1,002
" 7.....	"	281	1,208	1.56	645.71	1,895
July 25.....	"	228	759	.39	643.98	297
August 30.....	Yeates, W.....	293	881	.56	644.48	470
September 2.....	"	225	777	.41	644.10	320

(a) Ice measurement.

TWELFTH ANNUAL REPORT OF THE

Daily Gauge Height in feet and Discharge in second-feet of Grand River at Brantford for year ending September 30th, 1919

Sec-ft.	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	644.71	740	645.40	1440	645.33	1360	645.35	1380	645.27	640	645.46	1390	645.75	1930	645.62	1750	645.14	1140	644.27	442	644.02	310	643.83	215
2	644.69	725	645.17	1170	645.12	1120	645.42	1470	645.37	710	646.39	2800	645.48	1550	645.58	1690	644.96	960	644.37	500	643.83	215	644.29	454
3	644.62	675	645.06	1060	645.06	1060	645.56	1520	645.29	655	646.35	2730	645.42	1470	645.60	1720	644.92	920	644.37	500	643.79	195	644.21	406
4	644.62	675	645.12	1120	645.19	1190	645.61	145	645.10	520	646.25	2730	645.44	1500	646.17	820	644.81	755	644.19	395	644.06	330	644.12	360
5	644.46	560	645.21	1210	645.00	1020	645.10	1000	644.96	436	646.00	2300	645.37	1400	650.73	1380	645.77	785	644.35	490	644.00	300	644.14	370
6	644.50	590	645.56	1660	644.89	890	645.21	1110	644.83	365	647.04	4180	645.46	1520	649.62	10650	645.85	2070	644.29	454	644.00	200	644.14	370
7	644.58	645	645.37	1400	644.89	890	645.42	1340	645.04	484	646.54	3250	645.87	2100	647.75	5620	645.87	2100	644.39	515	643.98	290	643.98	290
8	644.64	690	645.29	1310	645.04	1040	645.33	1240	645.04	484	646.58	2590	646.39	2980	646.77	3670	645.29	1310	644.27	442	643.98	290	644.12	360
9	644.79	800	645.19	1190	645.06	1060	645.25	1150	644.87	385	646.98	2270	646.81	3740	646.37	645.10	646.21	406	643.83	215	644.17	385	644.08	340
10	644.79	800	645.39	1430	645.12	1120	644.92	830	645.08	510	645.62	1750	647.46	5020	646.14	2540	644.94	940	644.21	406	643.94	270	644.08	340
11	644.77	785	646.12	2500	645.23	1240	645.00	730	644.87	385	645.85	2070	650.56	13330	646.14	2540	644.94	940	644.17	385	643.89	245	644.06	330
12	644.64	690	645.85	2070	645.56	1660	644.96	700	644.64	64	645.83	4020	649.58	10530	646.54	3250	645.77	785	644.04	320	643.89	245	644.02	310
13	644.58	645	645.58	1610	645.33	1550	645.33	1030	644.69	69	646.96	4020	647.89	5950	646.59	5340	644.71	740	643.96	280	644.12	360	643.73	165
14	644.54	620	645.33	1360	645.74	1920	645.29	990	644.75	555	646.46	3040	647.89	4300	646.37	2910	644.67	710	644.10	350	644.12	360	643.75	175
15	644.67	710	645.12	1210	651.17	15180	645.06	496	644.92	675	646.14	2540	646.56	3290	645.96	2240	644.60	660	644.17	385	644.06	330	643.96	280
16	644.60	660	645.04	1040	650.04	11820	645.04	484	645.27	970	647.14	2540	646.56	3290	645.71	1870	644.75	770	644.14	370	643.77	185	644.04	320
17	644.62	675	645.65	1060	647.69	570	646.06	1160	647.97	970	650.65	171850	649.60	10310	646.47	2770	644.62	675	644.62	360	644.00	300	644.02	320
18	644.54	620	645.52	1610	645.33	1550	645.33	1030	644.69	69	646.96	4020	647.89	5950	646.59	5340	644.71	740	643.96	280	644.21	406	644.04	320
19	644.46	560	645.02	1020	646.58	3320	645.14	550	645.21	910	652.58	20090	647.64	5380	646.35	2910	644.67	710	644.10	350	644.12	360	643.75	175
20	644.58	645	645.27	1280	646.17	2590	645.14	550	645.02	745	650	1212050	646.71	3560	646.25	2730	644.37	500	643.96	280	644.42	335	644.12	360
21	644.71	740	645.54	1640	645.77	1360	645.14	550	644.83	610	650.87	14220	646.33	2870	646.52	3220	644.52	560	644.12	360	644.35	490	644.27	442
22	645.06	1060	645.44	1500	645.23	610	644.81	595	649.52	10370	646.15	2550	647.33	4760	644.44	550	644.14	370	644.39	515	644.64	690	644.23	418
23	645.42	1470	645.18	1180	649.92	11490	645.23	610	645.14	845	648.14	6590	645.85	2070	649.71	10900	644.46	560	644.12	360	644.29	454	644.83	835
24	645.12	1120	645.15	1150	648.92	8690	645.58	880	645.06	780	648.12	6540	645.73	1900	648.46	7430	644.27	412	644.12	360	644.23	418	644.58	645
25	644.98	980	644.96	960	646.92	4020	646.33	1760	645.21	910	648.12	6540	645.73	1900	647.89	5950	644.52	370	644.14	370	644.25	430	644.50	590
26	644.81	820	644.96	960	646.00	2300	646.29	1710	644.96	700	648.17	6670	645.64	1780	647.02	4140	644.52	605	644.00	300	644.21	406	644.52	605
27	644.75	770	644.87	875	645.56	1660	646.17	1540	645.19	890	648.42	7320	645.42	1470	646.39	2980	644.48	575	644.04	320	644.25	430	644.23	418
28	644.87	875	644.81	820	645.54	1640	645.98	1300	645.14	845	649.56	10480	645.48	1550	645.94	2200	644.44	550	644.04	320	644.23	418	644.00	300
29	644.96	960	644.92	920	645.50	1580	645.69	990	.....	.....	647.46	5020	645.62	1750	645.58	1690	644.39	515	644.08	340	644.25	430	644.12	360
30	646.06	2400	644.92	644.92	920	645.44	1500	645.54	845	.....	646.58	3320	645.69	1850	645.35	1380	644.46	560	644.00	300	644.04	320	644.12	360
31	645.69	1850	.....	645.29	1310	645.44	760	.....	.....	646.21	2660	.....	645.21	21120	.....	645.21	644.06	330	644.10	350	644.06	330	644.12	360

Monthly Discharge of Grand River at Brantford for year ending
September 30th, 1919

Drainage Area, 2,000 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October ..(1918).	2,400	560	857	1.20	.28	.43	.50
November "	2,500	820	1,266	1.25	.41	.63	.70
December "	15,180	890	3,168	7.59	.44	1.58	1.82
January (1919).	1,760	484	982	.88	.24	.49	.56
February	970	365	657	.48	.18	.33	.34
March	37,360	1,260	6,612	18.68	.63	3.31	3.82
April.....	13,330	1,400	3,698	6.66	.70	1.85	2.06
May.....	13,840	1,210	3,898	6.92	.60	1.95	2.25
June	2,100	442	819	1.05	.22	.41	.46
July	515	205	373	.26	.10	.19	.22
August	560	185	352	.28	.09	.18	.21
September	835	165	394	.42	.08	.20	.22
The year.....	37,360	165	1,938	18.68	.08	.97	13.15

Grand River near Conestogo

Location—At the highway bridge $\frac{1}{4}$ mile below the Village of Conestogo, Township of Woolwich, County of Waterloo.

Records Available—From July 16, 1913.

Drainage Area—550 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the centre pier of bridge. Elevation of zero is 1017.00 feet.

Channel and Control—The channel is straight for about 300 feet above and below the gauging section. The banks are low and liable to overflow. The bed is composed of gravel, and all the water is confined between the abutments of the bridge, except at a very serious flood. In flood stages the banks and bed are liable to shift slightly.

Discharge Measurements—Made from the bridge during high water, and at a permanent low water section located 600 feet upstream during the low water period.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice during the winter season, and measurements are made to determine the winter flow.

Accuracy—The slight shifting of the channel has little effect. The rating curve is well defined, and records are good.

Observer—Geo. Schinbein, Conestogo.

Discharge Measurements of Grand River near Conestogo for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 18.....	Roberts, E.....	130	100	1.30	1018.79	130(a)
May. 26.....	"	148	374	2.50	1019.67	934
Sept. 17.....	"	120	77	.45	1017.83	34

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Grand River near Conestogo for year ending
September 30th, 1919

Sec. Ht. =	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge Sec.-ft.																						
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1 1018.27	94	1018.87	298	1018.52	166	1018.89	226	1019.21	274	1019.92	695	1019.21	477	1019.00	360	1018.33	109	1017.83	33	1017.81	31	1017.67	17	
2 1018.27	94	1018.71	234	1018.48	154	1019.12	320	1018.94	172	1019.69	535	1019.08	400	1019.04	380	1018.31	103	1017.81	31	1017.67	17			
3 1018.27	94	1018.52	166	1018.60	190	1019.12	320	1018.92	166	1019.77	590	1019.02	370	1019.25	505	1018.23	86	1017.85	35	1017.58	8	1017.92	42	
4 1018.27	94	1018.75	250	1018.50	160	1019.00	270	1018.96	178	1020.04	795	1018.92	320	1022.25	3740	1018.19	78	1017.94	44	1017.60	10	1017.64	14	
5 1018.19	95	1019.12	422	1018.44	142	1018.83	202	1018.96	178	1020.75	1470	1018.96	340	1022.08	3510	1018.94	330	1017.87	37	1017.64	14	1017.73	23	
6 1018.27	94	1019.02	370	1018.39	127	1019.14	330	1019.31	133	1020.33	1060	1019.29	535	1020.62	1760	1020.00	1200	1017.79	29	1017.60	10	1017.62	12	
7 1018.35	95	1018.81	270	1018.48	154	1020.96	1920	1018.83	139	1020.08	830	1019.92	1050	1019.92	1050	1019.17	452	1017.83	33	1017.56	6	1017.62	12	
8 1018.85	290	1018.73	242	1018.54	172	1020.83	1770	1018.83	139	1019.79	605	1020.04	1160	1019.50	680	1018.71	234	1017.89	39	1017.60	10	1017.77	27	
9 1018.77	258	1019.21	477	1018.83	282	1020.62	1540	1018.69	98	1019.33	325	1020.60	1740	1019.14	454	1018.58	184	1017.73	23	1017.69	19	1017.83	33	
10 1018.54	172	1020.06	1180	1018.38	350	1020.42	1340	1018.62	84	1019.27	400	1019.08	600	1018.50	160	1017.60	121	1017.62	27	1017.58	8	1017.67	17	
11 1018.44	142	1019.54	710	1019.19	410	1020.33	1310	1018.62	84	1019.12	422	1022.67	4350	1019.42	635	1018.37	121	1017.77	27	1017.60	10	1017.64	14	
12 1018.31	103	1019.19	464	1018.94	330	1020.25	1170	1018.75	115	1019.25	505	1021.25	2470	1020.00	1120	1018.35	115	1017.87	37	1017.56	6	1017.67	17	
13 1018.21	82	1018.96	340	1019.04	380	1020.12	1050	1018.73	109	1019.42	625	1020.50	1630	1019.71	860	1018.31	103	1017.83	33	1017.60	10	1017.89	39	
14 1018.25	90	1018.79	266	1018.35	450	1019.98	915	1018.79	127	1019.71	860	1020.08	1200	1019.33	560	1018.37	121	1017.81	31	1017.81	31	1017.67	17	
15 1018.23	86	1018.73	242	1022.33	1450	1019.96	650	1019.69	505	1019.25	840	1019.09	360	1018.37	121	1017.89	39	1017.71	21	1017.64	21	1017.64	14	
16 1018.27	94	1018.67	218	1012.50	2770	1019.79	750	1019.14	246	1020.75	1900	1020.64	1780	1018.89	306	1018.21	82	1017.87	37	1017.92	31	1017.81	33	
17 1018.31	103	1018.54	172	1020.87	2040	1019.71	690	1018.94	172	1021.33	6960	1022.00	3410	1019.25	505	1018.10	60	1017.60	23	1017.73	31	1017.83	33	
18 1018.58	86	1018.58	184	1020.37	1490	1019.58	595	1018.87	151	1026.50	10430	1020.96	2140	1019.46	560	1018.12	64	1017.64	14	1017.92	42	1017.73	23	
19 1018.23	86	1018.94	330	1019.89	1020	1019.33	428	1018.77	121	1022.17	3630	1020.19	1310	1019.17	452	1018.08	58	1017.64	14	1017.58	8	1017.82	39	
20 1018.25	90	1019.31	545	1019.46	650	1019.31	416	1018.85	139	1022.46	4030	1019.71	860	1019.06	390	1018.06	56	1017.60	10	1018.14	68	1017.79	29	
21 1019.04	380	1019.08	400	1019.35	575	1019.25	385	1018.75	115	1022.96	4770	1019.54	710	1019.94	1070	1018.06	56	1017.85	35	1018.00	50	1018.14	68	
22 1019.19	464	1018.92	320	1021.27	2490	1019.14	330	1018.75	115	1021.29	2520	1019.31	545	1021.62	2920	1017.83	33	1017.80	59	1018.02	52	1018.12	64	
23 1018.87	298	1018.75	250	1022.46	4030	1019.50	540	1018.73	109	1021.17	2370	1019.21	477	1021.25	2470	1017.89	39	1017.87	37	1017.98	48	1018.17	74	
24 1018.67	218	1018.42	136	1020.85	2020	1020.12	960	1018.79	127	1021.33	2570	1019.15	440	1020.87	2040	1017.85	35	1017.73	23	1017.89	39	1018.12	64	
25 1018.48	154	1018.35	115	1019.62	780	1020.10	940	1018.75	115	1021.39	2640	1019.06	390	1020.12	1240	1018.02	52	1017.58	8	1017.81	31	1017.94	44	
26 1018.50	160	1018.39	127	1019.17	452	1020.06	905	1018.73	109	1021.79	3140	1018.87	298	1019.58	745	1018.06	56	1017.60	10	1018.02	52	1017.94	44	
27 1018.37	121	1018.42	136	1019.14	464	1018.92	98	1018.69	98	1022.54	4150	1018.77	452	1018.00	61	1017.56	56	1017.81	31	1018.06	52	1018.12	64	
28 1018.69	226	1018.37	121	1019.33	560	1019.75	645	1018.81	133	1021.17	2370	1019.04	380	1018.87	298	1017.94	44	1017.62	12	1017.87	37	1017.73	23	
29 1019.83	965	1018.58	184	1019.19	464	1019.62	484	1020.42	1540	1019.33	560	1018.71	234	1017.83	33	1017.58	8	1017.77	27	1017.67	17			
30 1019.50	680	1019.00	360	1019.14	434	1019.35	335	1019.87	1000	1019.12	422	1018.60	190	1017.83	33	1017.60	10	1017.75	25	1017.73	23			
31 1018.81	274	.....	1018.94	330	1019.25	290	.....	1019.67	825	.....	1018.50	160	.....	1017.58	8	1017.67	17	.....	.....	.....	.....	.....	.....

Monthly Discharge of Grand River near Conestogo for year ending
September 30th, 1919

Drainage Area, 550 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
	965	78	300	1.75	.14	.54	.62
October (1918)	1,180	115	318	2.15	.21	.58	.65
November "	2,770	127	854	5.04	.23	1.55	1.79
December.. "	1,920	202	743	3.49	.37	1.35	1.56
January.. (1919)	274	84	141	.50	.15	.26	.27
February	10,430	325	2,103	18.96	.59	3.82	4.40
March.....	4,330	266	1,121	7.87	.48	2.04	2.28
April.....	3,740	169	983	6.80	.29	1.79	2.06
May.....	1,200	33	142	2.18	.06	.26	.29
June.	50	6	25	.09	.01	.05	.06
July.....	68	6	29	.12	.01	.05	.06
August.....	74	8	30	.13	.01	.05	.06
The year	10,430	6	571	18.96	.01	1.04	14.12

Grand River at Galt

Location—At the Concession Street bridge, in the City of Galt, Township of North Dumfries, County of Waterloo.

Records Available—From July 21, 1913.

Drainage Area—1,360 square miles.

Gauge—Vertical steel staff 0 to 12 feet on first left pier of the bridge. Elevation of zero of gauge is 851.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed is solid rock formation. Residents each year encroach on the natural channel by building up the banks.

Discharge Measurements—Made from bridge for high stages, and at a permanent wading section 150 feet upstream during low stages.

Winter Flow—Ice slightly affects the relation of gauge height to discharge during the winter, and measurements are made to determine the winter flow.

Regulation—This section is subject to serious fluctuations in the river stage caused by the operation of the Galt dam situated $\frac{1}{4}$ mile above.

Accuracy—The rating curve is fairly well defined, and records are good.

Observer—Charles Parker, Galt.

Discharge Measurements of Grand River at Galt for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
January 14.....	Roberts, E.....	180	620	.87	852.85	536 (a)
February 16.....	".....	180	673	.71	852.81	476 (a)
May 26.....	".....	193	1,024	1.91	854.58	1,962
September 17.....	".....	135	170	.58	851.71	98

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Grand River at Galt for year ending September 30th, 1919

No. Oct.	Gauge Ht., Feet	Dis- charge, Sec.-ft.	November		December		January		February		March		April		May		June		July		August		September			
			Gauge Ht., Feet	Dis- charge, Sec.-ft.																						
			Gauge Ht., Feet	Dis- charge, Sec.-ft.																						
1 852.42	342	853.42	815	695	853.12	650	852.21	650	854.02	1300	853.87	1166	853.48	855	852.79	494	851.98	182	851.62	74	851.118	118	851.79	118		
2 852.37	323	853.08	630	852.60	413	853.46	540	853.89	540	854.33	1240	853.92	755	853.35	785	852.67	442	851.94	168	851.56	65	851.83	131	851.77	112	
3 852.21	264	852.98	580	852.62	421	853.43	46	845	852.87	530	853.98	1260	853.42	815	853.62	955	852.56	397	851.81	124	851.56	61	851.77	112	851.77	112
4 852.19	256	853.02	600	852.85	520	853.12	650	852.75	476	854.10	1380	853.39	800	854.71	2090	852.48	365	851.79	118	851.79	118	851.77	112	851.77	112	
5 852.14	238	853.12	650	852.67	442	853.08	630	852.54	389	855.06	2590	853.35	775	858.54	9040	852.44	350	851.81	124	851.69	90	851.77	112	851.77	112	
6 852.17	221	853.54	695	852.60	413	853.08	630	852.51	357	855.46	2960	853.53	54	855.56	715300	854.08	1360	851.83	131	851.71	95	851.73	101	851.73	101	
7 852.29	293	853.27	725	852.67	442	852.92	570	852.69	450	855.00	2500	854.10	1380	855.25	2860	853.71	1020	851.94	168	851.69	90	851.71	95	851.71	95	
8 852.42	342	853.08	630	852.87	530	852.94	560	852.71	458	854.46	1770	854.62	1970	854.37	1660	853.14	660	851.83	131	851.67	85	851.83	131	851.71	95	
9 852.83	510	853.14	660	853.00	590	852.77	484	852.46	357	853.75	1060	855.12	2670	854.04	1320	853.00	590	851.83	131	851.62	74	851.71	95	851.71	95	
10 852.62	421	854.08	6360	853.25	715	852.64	429	852.67	446	845.46	87	856.08	853.75	1060	852.81	505	851.73	101	851.58	65	851.67	85	851.67	85		
11 852.54	389	854.25	1530	853.44	830	852.60	413	852.46	357	853.71	1020	858.83	97	856.91	854.87	2310	852.64	429	851.79	118	851.67	85	851.69	90		
12 852.46	357	853.73	1040	853.48	855	852.69	450	852.42	342	853.62	955	857.25	25	820	854.64	2000	852.46	357	851.67	85	851.69	90	851.71	95		
13 852.42	342	853.37	785	853.21	695	852.60	413	852.27	286	854.75	2150	855.87	3860	854.69	2070	852.35	315	851.60	69	851.60	69	851.62	74			
14 852.48	365	853.12	650	851.17	1450	852.73	468	852.46	357	854.17	855.17	856.25	2670	854.21	1490	852.32	304	851.83	131	851.67	85	851.64	78			
15 852.37	323	853.08	630	850.91	1060	852.73	468	852.98	580	854.25	1530	854.42	1720	853.75	1060	852.32	304	851.73	118	851.73	101	851.69	90			
16 852.44	350	852.73	468	851.79	7350	853.12	650	852.77	484	855.62	3440	854.21	1490	853.46	845	852.33	308	851.81	124	851.67	85	851.69	90			
17 852.37	323	852.75	476	850.04	4150	852.64	429	852.85	520	859.96	13560	857.96	7710	853.81	1110	852.27	286	851.83	131	851.67	85	851.77	112			
18 852.48	365	852.79	494	855.37	3040	852.67	442	852.67	446	864	300	859.07	856.58	5070	854.17	1450	852.12	231	851.58	65	851.89	112	851.77	112		
19 852.60	413	852.83	510	854.67	2040	852.81	505	852.77	484	859.04	10370	855.71	3500	853.69	1240	852.10	224	851.54	56	851.94	168	851.83	131			
20 852.90	544	853.17	1120	854.17	1450	852.73	421	858.46	8840	854.58	1920	853.83	831120	852.10	224	851.60	224	851.60	69	852.02	196	851.73	101			
21 853.10	640	853.56	910	853.92	1200	852.79	494	852.46	357	859.29	11140	854.23	1510	854.36	217	851.79	118	852.04	203	851.96	175	851.96	175			
22 853.37	323	852.75	760	854.17	1450	852.77	484	852.44	350	857.83	7430	853.96	1240	856.37	4710	852.14	238	851.79	118	851.94	168	852.31	301			
23 853.27	725	853.06	620	857.37	6510	852.98	580	852.44	350	857.67	6040	853.71	1020	858.17	8150	851.92	161	851.83	131	851.96	161	852.21	264			
24 853.08	630	852.85	520	856.67	5230	854.00	1280	852.52	381	856.71	5300	853.60	940	856.25	4500	851.92	161	851.85	138	851.98	182	852.17	249			
25 852.79	494	852.75	476	854.67	2040	854.67	2040	852.71	458	856.71	5300	853.54	895	855.56	3350	851.96	175	851.79	118	851.94	168	852.08	217			
26 852.65	434	852.54	389	853.92	1200	854.14	1420	852.62	421	857.08	5960	853.35	775	854.73	2120	852.12	231	851.64	78	851.96	175	852.02	196			
27 852.56	397	852.39	330	853.06	550	852.50	517	851.56	855.83	853.71	7100	856.17	1450	852.17	249	851.56	65	851.81	92	851.92	161	852.02	196			
28 852.67	442	852.46	357	853.75	1060	853.91	710	852.62	421	858.12	8040	853.23	705	853.71	1020	852.02	196	851.77	112	851.92	161	852.02	196			
29 853.75	1060	852.52	381	853.69	1010	853.50	870	852.54	856.29	4576	853.56	910	853.29	740	852.10	224	851.75	106	851.92	161	852.04	203				
30 854.17	1450	853.02	600	853.21	695	853.46	845	854.54	1870	853.60	940	853.12	650	851.92	161	851.73	101	851.83	131	851.96	175	851.96	175			
31 853.62	955	.....	833.10	640	853.17	675	.....	854.25	1530	.....	852.98	580	.....	851.81	90	851.69	90	851.81	124	851.81	124	851.81	124

Monthly Discharge of Grand River at Galt for year ending
September 30th, 1919

Drainage Area, 1,360 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,450	238	485	1.07	.17	.36	.41
November "	1,530	330	683	1.12	.24	.50	.56
December "	10,600	413	1,925	7.79	.30	1.42	1.64
January (1919)	2,040	413	708	1.50	.39	.52	.60
February	695	286	431	.51	.21	.32	.33
March.....	30,090	845	4,995	22.12	.62	3.67	4.23
April.....	9,780	685	2,294	7.19	.50	1.69	1.89
May	9,040	580	2,244	6.65	.43	1.65	1.90
June	1,360	161	374	1.00	.12	.27	.30
July.....	182	56	114	.13	.04	.08	.09
August.....	203	61	120	.15	.04	.09	.10
September.....	301	74	140	.22	.05	.10	.11
The year.....	30,090	56	1,219	22.12	.04	.90	12.16

Grand River at Glen Morris

Location—At the Glen Morris bridge, in the Village of Glen Morris, Township of South Dumfries, County of Brant.

Records Available—Discharge measurements from August, 1912. Daily gauge heights from July 21, 1913.

Drainage Area—1,390 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the second pier from the left bank. Elevation of the zero of gauge is 801.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed of the river is composed of gravel and boulders, and banks are permanent. The bed and control is shifting under high water conditions.

Discharge Measurements—Made from bridge during the high water stages, and at permanent wading section located 150 feet upstream during the lower water periods.

Winter Flow—This section is seriously affected by ice which usually floods, forming as many as three or four layers of ice with water between them. Measurements are made during the winter months to determine the winter flow.

Regulation—This section is subject to fluctuations in the river stage, due to the storing of water, during the night and at week ends, by the Galt dam, located eight miles above.

Accuracy—Owing to poor natural conditions, the liability of the control to shift and back water caused by ice, the records cannot be considered better than fair.

Observer—Alfred Forbes, Glen Morris P.O.

Discharge Measurements of Grand River at Glen Morris for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
January 13.....	Roberts, E.	271	539	1.32	803.00	714 (a)
February 16.....	"	271	483	1.14	802.79	496 (a)
May 26.....	"	278	815	2.97	804.00	2,422
September 17.....	"	155	142	.82	802.21	117

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second feet of Grand River at Glen Morris for year ending September 30th, 1919

Monthly Discharge of Grand River at Glen Morris for year ending
September 30th, 1919

Drainage Area, 1,390 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	1,840	230	505	1.32	.17	.36	.42
November "	1,840	356	886	1.32	.26	.64	.71
December "	11,470	461	2,139	8.25	.33	1.54	1.78
January .. (1919)	1,350	279	620	.97	.20	.45	.52
February	615	185	367	.44	.13	.26	.27
March	34,170	1,050	5,471	24.58	.76	3.94	4.54
April	10,740	910	2,667	7.73	.65	1.92	2.14
May	9,680	635	2,439	6.96	.46	1.75	2.02
June	1,700	190	445	1.22	.14	.32	.36
July	230	104	157	.17	.07	.11	.13
August	230	104	158	.17	.07	.11	.13
September	500	104	173	.36	.07	.12	.13
The year	34,170	104	1,347	24.58	.07	.97	13.17

Grand River at York

Location—At the highway bridge in the Village of York, Township of Oneida, County of Haldimand.

Records Available—From June 25, 1913.

Drainage Area—2,280 square miles.

Gauge—Vertical steel staff 0 to 6 feet on the first pier from left abutment and 6 to 12 feet on the left abutment. The elevation of zero is 593.00, and has remained unchanged since established.

Channel and Control—The flow is confined between the abutments of the bridge at all stages. The bed of the river is well protected, but shifting during flood stages. A partly demolished dam about 200 feet downstream affects flow, especially at low stages. Part of this old dam is washed out at each flood period.

Discharge Measurements—Taken from the highway bridge, and at a permanent low water section located 800 feet above during the low water period.

Floods—No floods of a serious nature have occurred here since the spring of 1912, when the dam below the bridge was wrecked, the water cutting around the right abutment, greatly increasing the width of the channel. Village residents state the water rose to a gauge height of 606 feet, which would mean approximately 100,000 second feet.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—The nearest dam is at Caledonia, five miles above. The intermittent operation of the mills causes daily fluctuations in the gauge heights.

Accuracy—The conditions of flow are good, except for the fluctuations caused through the Caledonia Mills. Well-defined rating curves have been established, and the records can be considered good. Semi-daily gauge heights will not give a good representative mean.

Observer—Harry Brown, York P.O.

Discharge Measurements of Grand River at York for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
May. 27.....	Roberts, E.....	352	1,662	1.83	595.33	3,048
Sept. 16.....	"	339	949	.45	593.25	423

Daily Gauge Height in feet and Discharge in second-feet of Grand River at York for year ending September 30th, 1919

Gauge Ht. Sec.-ft.	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht. Feet	Dis- charge Sec.-ft.																						
		Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.			
1 593.62	635	594.56	1780	593.94	930	594.33	1420	594.58	1650	594.04	1030	594.92	2400	594.54	1740	594.27	1330	593.39	485	593.27	428	593.25	420	
2 593.58	605	594.37	1470	594.17	1190	594.64	1910	594.21	1110	595.29	3190	594.64	1910	594.67	1960	594.12	1130	593.35	465	593.19	397	593.29	436	
3 593.73	675	594.17	1190	594.12	1130	594.04	2080	594.08	970	595.58	380	594.31	1380	594.73	2060	594.10	1100	593.33	455	593.10	370	593.23	412	
4 593.67	675	594.15	1160	594.04	1030	594.04	2250	594.04	930	595.56	3840	594.19	1220	595.12	880	593.39	485	593.06	358	593.08	364			
5 593.64	650	594.12	1130	594.08	1080	594.08	2420	594.54	1580	595.10	2760	594.23	1270	597.54	10630	593.85	840	593.48	540	592.96	332	593.10	370	
6 593.58	605	594.25	1340	594.00	990	594.00	2590	595.67	1370	595.67	4120	594.39	1500	597.67	1170	593.85	840	593.54	580	592.96	332	593.14	382	
7 593.56	630	594.31	1380	594.00	990	594.00	2760	594.00	1160	595.56	3840	594.52	1710	597.60	10880	594.87	2310	593.56	590	593.06	358	593.21	404	
8 593.60	620	594.29	1360	593.85	840	594.06	2930	594.06	950	595.44	3550	595.10	1670	597.87	12020	594.46	1620	593.48	540	593.10	370	593.23	412	
9 593.62	635	594.25	1300	593.92	910	595.25	3100	593.87	765	594.89	2340	594.46	920	594.29	1360	593.39	485	593.10	370	593.14	382			
10 593.58	605	594.10	1100	595.12	2800	595.08	2720	593.77	675	594.81	2200	594.69	1990	595.17	2910	594.19	1220	593.44	515	593.10	370	593.10	370	
11 593.64	650	594.67	1960	594.31	1380	595.12	2800	593.71	630	594.81	2200	596.98	8420	595.33	3280	493.98	970	593.50	550	593.10	370	593.17	391	
12 593.67	675	594.94	2440	594.56	1780	595.50	2720	593.60	550	595.50	3690	597.85	940	595.52	3740	593.89	880	593.44	515	593.02	346	593.10	370	
13 593.65	660	594.56	1780	595.04	2170	595.04	2630	593.62	565	595.60	3940	596.33	6110	595.50	3690	593.85	840	593.46	593.06	593.06	358	593.06	358	
14 593.60	620	594.44	1580	594.62	1870	595.02	2590	593.71	630	595.54	3790	595.32	4810	595.44	3550	593.83	820	593.31	445	593.14	382	592.96	332	
15 593.73	725	594.31	1380	595.72	7860	595.19	2740	593.81	710	595.37	3380	595.62	3990	595.35	3330	593.75	745	593.35	465	593.21	404	592.92	324	
16 593.46	525	594.56	1780	597.77	11590	595.04	2440	593.89	880	596.12	5240	595.98	4990	594.94	2440	593.71	725	593.35	465	593.19	397	592.98	336	
17 593.58	605	594.04	1030	596.54	6820	595.64	1790	594.21	1240	598.16	101340	596.46	6540	595.87	4640	593.71	710	593.27	428	593.02	346	593.02	346	
18 593.67	675	593.94	930	595.96	4930	594.60	1680	594.04	1030	600.42	28060	596.46	6340	595.62	3900	593.67	675	593.19	397	593.23	412	593.04	352	
19 593.58	605	593.94	930	595.00	2560	594.58	1650	594.04	1030	601.37	36240	596.35	6180	595.48	3640	593.79	780	593.21	404	593.17	391	593.04	352	
20 593.54	680	594.00	990	595.25	3100	594.44	1430	594.04	1030	597.71	11340	595.71	4230	595.67	4120	593.71	710	593.19	397	593.23	412	592.98	336	
21 593.65	660	594.33	1420	595.00	2550	594.42	1400	593.96	950	597.33	9780	595.29	3190	595.83	4550	593.62	635	593.23	455	592.94	328			
22 593.52	565	594.50	1680	594.69	1990	594.42	1400	593.79	780	597.33	9780	595.12	2800	595.50	4550	593.31	445	593.27	428	592.98	336			
23 593.65	660	594.42	1550	595.83	4550	594.56	1620	594.31	1270	596.31	6040	594.98	2510	596.56	6890	593.44	515	593.39	485	593.19	397	593.12	376	
24 594.17	1190	594.17	1190	597.00	8500	594.64	1740	595.21	3000	596.10	5360	594.75	2100	596.62	7100	593.42	500	593.35	465	593.23	412	593.27	428	
25 594.31	1380	594.10	1100	595.98	4990	595.79	4170	594.35	1440	596.08	5300	594.67	1960	596.46	6540	593.48	540	593.23	412	593.27	428	593.33	455	
26 593.98	970	593.79	780	595.17	2910	595.31	3000	596.12	1300	596.12	5420	594.62	1870	596.10	5360	593.56	590	593.17	391	593.31	445	593.27	428	
27 593.79	780	593.87	860	594.73	1270	595.47	2100	594.02	1010	596.81	7790	594.44	1580	595.19	2660	593.50	550	593.23	412	593.33	465	593.33	465	
28 594.87	2310	593.83	820	594.17	1190	594.97	2130	596.11	550	596.42	6410	594.47	1480	594.79	2160	593.39	485	593.17	391	593.33	445	593.33	455	
29 594.87	2310	593.89	880	594.81	2200	594.92	2250	596.11	550	596.42	6410	594.47	1580	594.54	1740	593.33	455	593.23	412	593.33	455	593.33	455	
30 594.46	1620	594.64	1910	594.67	1790	594.64	2250	596.11	550	596.42	6410	594.47	1580	594.54	1740	593.31	445	593.29	436	593.29	436			
31 594.85	2270	594.64	594.64	594.64	1910	594.67	1790	594.64	550	596.42	6410	594.47	1580	594.54	1740	593.31	445	593.29	436	593.29	436			

Monthly Discharge of Grand River at York for year ending
September 30th, 1919

Drainage Area, 2,280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October. (1918)	2,310	525	883	1.01	.23	.39	.45
November "	2,440	780	1,301	1.07	.34	.57	.64
December "	11,590	840	2,890	5.08	.37	1.27	1.46
January (1919)	4,170	1,400	2,318	1.83	.61	1.08	1.18
February	3,000	550	1,084	1.32	.24	.48	.50
March.....	36,240	1,030	6,787	15.89	.45	2.98	3.44
April.....	9,940	1,220	3,339	4.36	.54	1.46	1.63
May ,.....	12,020	1,480	4,765	5.27	.65	2.09	2.41
June.....	2,310	455	864	1.01	.20	.38	.42
July.....	590	391	461	.26	.17	.20	.23
August.....	475	332	401	.21	.15	.18	.21
September	465	324	387	.20	.14	.17	.19
The year	36,240	324	2,139	15.89	.14	.94	12.76

Speed River at Hespeler

Location—At a point 100 feet below the jail, which adjoins the power house, in the Town of Hespeler, Township of Waterloo, County of Waterloo.

Records Available—Discharge measurements from July 10, 1913. Daily gauge heights from October 23, 1913.

Drainage Area—250 square miles.

Gauge—Vertical steel staff 0 to 12 feet on jail wall adjoining power house. The elevation of zero of the gauge is 935.00.

Channel and Control—Straight for about 300 feet above and below the gauging section. Loose gravel forms the bed of this stream, which is decidedly shifting. The banks are low, and overflow when the water rises 2 feet above normal. Weeds at the control and in channel have a decided effect at the gauging section.

Discharge Measurements—Made from a permanent wading section 100 feet below the gauge during the low stages, and the dam 400 feet above will be used as a weir during the flood season.

Winter Flow—The relation of gauge height to discharge is somewhat affected by the presence of ice for a short period during the winter season.

Regulation—A dam 400 ft. above this section causes serious fluctuations in the river stage during the low water period.

Accuracy—Owing to the shifting bed and the presence of weeds at and below section, greatly interfering with the metering of stream, these records can only be classed as fair.

Observer—W. D. Scott, Hespeler.

Discharge Measurements of Speed River at Hespeler for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918 November 23.....	Roberts, E....	96	86	1.27	936.42	110(a)
1919 January 14.....	"	92	101	1.33	936.44	134
February 15.....	"	94	102	1.36	936.46	138
May 26.....	"	101	189	2.55	937.35	480
September 17.....	"	93	82	.97	936.42	79

(a) Ice measurement.

HYDRO-ELECTRIC POWER COMMISSION

Daily Gauge Height in feet and Discharge in second-feet of Speed River at Hespeler for year ending September 30th, 1919

Date	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.	Gauge Ht.	Discharge Sec.-ft.
	Feet	Feet																						
1 936.50	138	936.56	154	936.37	113	936.60	164	936.52	143	936.50	138	937.00	310	936.87	255	936.48	134	936.19	87	936.12	79	936.23	92	936.23
2 936.50	138	936.56	154	936.48	134	936.67	185	936.37	113	936.77	218	936.73	204	936.96	263	936.42	122	936.19	87	936.12	79	936.29	99	936.29
3 936.46	130	936.50	138	936.64	176	936.77	218	936.35	109	936.85	247	936.71	197	936.89	263	936.48	134	936.19	87	936.06	73	936.27	96	936.25
4 936.46	130	936.56	154	936.52	143	936.81	232	936.39	116	936.94	284	936.73	204	937.42	525	936.50	138	936.21	89	936.25	70	936.25	94	936.25
5 936.44	126	936.58	159	936.48	134	936.77	218	936.35	109	936.97	255	936.56	600	936.73	204	938.02	885	936.44	126	936.14	81	936.25	94	936.21
6 936.17	85	936.62	170	936.44	126	936.69	191	936.35	109	937.25	433	936.83	240	938.02	885	936.44	126	936.14	81	936.27	96	936.14	81	936.25
7 936.42	122	936.58	159	936.42	122	936.69	191	936.29	99	937.25	433	937.04	329	937.54	590	936.44	126	936.14	81	936.25	94	936.33	105	936.25
8 936.33	105	936.58	159	936.37	113	936.52	143	936.31	102	936.96	293	937.10	358	937.02	320	936.50	138	936.17	85	936.23	92	936.25	94	936.25
9 936.29	99	936.50	138	936.44	126	936.46	130	936.27	96	936.81	232	937.27	443	936.98	301	936.44	126	936.14	81	936.23	92	936.25	94	936.25
10 936.29	99	936.56	150	936.44	126	936.54	148	936.27	96	936.79	225	937.64	650	936.96	295	936.44	126	936.14	81	936.06	73	936.25	94	936.25
11 936.27	96	936.46	130	936.52	143	936.52	143	936.35	109	936.71	197	938.10	935	937.44	535	936.39	116	936.14	81	936.21	89	936.23	92	936.23
12 936.27	96	936.48	134	936.58	159	936.58	159	936.57	156	936.31	102	936.81	232	938.00	870	937.81	750	936.33	105	936.12	79	936.25	94	936.21
13 936.14	81	936.48	134	936.48	134	936.62	170	936.42	122	936.35	109	937.23	423	937.60	625	937.67	66	936.31	102	936.06	73	936.27	96	936.21
14 936.27	96	936.50	138	936.46	126	936.52	158	936.29	95	936.86	231	937.35	485	937.46	545	936.35	109	936.06	68	936.25	94	936.14	81	936.25
15 936.29	99	936.53	105	936.44	126	936.54	148	936.27	96	936.79	225	937.64	650	936.96	295	936.44	126	936.14	81	936.23	92	936.25	94	936.25
16 936.29	96	936.46	130	936.52	143	936.52	143	936.35	109	936.71	197	938.10	935	937.44	535	936.39	116	936.14	81	936.21	89	936.23	92	936.23
17 936.35	105	936.46	130	937.21	413	936.35	109	936.42	122	940.10	2400	938.42	1150	937.00	423	936.27	96	936.08	75	936.31	102	936.31	102	936.31
18 936.35	105	936.52	143	936.92	276	936.39	116	936.44	126	941.96	3790	937.92	820	938.37	1110	938.37	110	936.10	77	936.46	130	936.29	99	936.29
19 936.39	116	936.48	134	936.94	284	936.39	116	936.42	122	940.94	2280	937.67	625	937.12	368	936.29	138	936.17	85	936.37	113	936.27	96	936.27
20 936.25	94	936.52	143	936.74	208	936.44	126	936.42	122	939.08	1630	937.58	615	937.08	348	936.27	96	936.17	85	936.23	102	936.31	102	936.31
21 936.31	102	936.52	143	936.52	143	936.74	208	936.39	116	936.42	122	938.79	1410	937.21	413	937.29	453	936.23	92	935.94	64	936.29	99	936.29
22 936.35	109	936.52	143	937.04	329	936.42	122	936.37	113	938.02	885	936.81	232	938.08	920	936.25	92	936.35	109	936.29	99	936.29	99	936.29
23 936.35	109	936.46	130	937.48	555	936.52	143	936.42	122	937.96	845	936.79	225	938.37	1110	936.27	96	936.21	89	936.33	105	936.31	102	936.31
24 936.33	105	936.31	102	937.71	690	936.89	263	936.42	122	937.92	820	936.79	225	938.14	960	936.27	96	936.23	92	936.21	89	936.31	102	936.31
25 936.35	109	936.42	122	937.52	580	936.83	240	936.42	122	937.85	775	936.77	218	937.77	725	936.29	96	936.23	92	936.27	96	936.31	102	936.31
26 936.37	113	936.42	122	936.77	218	936.79	218	936.35	116	937.87	785	936.71	197	937.64	650	936.27	96	936.23	92	936.29	99	936.31	102	936.31
27 936.48	134	936.48	134	936.75	211	936.73	204	936.42	122	937.89	800	936.73	204	936.79	185	937.29	453	936.25	94	936.27	96	936.31	102	936.31
28 936.48	134	936.46	130	937.48	555	936.52	143	936.42	122	937.96	845	936.79	204	936.77	225	936.23	92	936.25	94	936.25	94	936.33	105	936.33
29 936.50	138	936.44	126	936.73	204	936.60	164	.....	.....	937.83	765	936.75	211	936.81	232	936.25	94	936.25	94	936.25	94	936.33	105	936.33
30 936.52	143	936.46	130	936.73	204	936.58	159	.....	.....	937.33	474	936.77	218	936.64	176	936.23	92	936.10	77	936.28	99	936.33	105	936.33
31 936.54	148	.....	.....	.....	.....	936.56	185	936.56	154	.....	.....	937.17	393	936.10	170	926.62	107	936.08	75	936.08	75	936.08	75	936.08

Monthly Discharge of Speed River at Hespeler for year ending
September 30th, 1919

Drainage Area, 250 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October .. (1918)	148	81	113	.59	.32	.45	.52
November " "	170	105	137	.68	.42	.55	.62
December " "	765	113	274	3.06	.45	1.10	1.27
January (1919)	263	109	163	1.05	.43	.65	.75
February	143	96	113	.57	.38	.45	.47
March.....	3,790	138	790	15.16	.55	3.16	3.64
April	1,150	185	419	4.60	.74	1.68	1.87
May.....	1,180	170	508	4.72	.68	2.03	2.34
June	138	92	109	.55	.37	.44	.49
July	94	63	82	.38	.25	.33	.38
August	130	70	95	.52	.28	.38	.44
September	105	81	97	.42	.32	.39	.43
The year	3,790	63	243	15.16	.25	.97	13.17

Table Showing Run-Off as Per Cent. Precipitation, 1918-19

River	Location	District	Precipitation Station	Inches Precip'n	Run-Off	%
Black	Washago	Eastern Ont....	Gravenhurst .. Clontarf..... Pembroke..... Renfrew	37.25 33.90 33.50	23.40 16.29 14.93	62.8 48.1 44.6
Bonnechere	Renfrew.....	"	Madawaska .. Algonquin Park Beatrice			
Madawaska	Madawaska	"	Emsdale	37.31	30.35	81.2
Maganatawan, N.	Burk's Falls....	"	Gravenhurst .. Rouville			
" S..	"	"	Algonquin Park Beatrice	37.31	22.50	60.4
Mississippi	Appleton	"	Emsdale..... Gravenhurst .. Rouville			
"	Ferguson's Falls	"	Almonte	34.43	20.00	58.1
"	Galetta.....	"	Westport..... Almonte	38.08 34.43	20.90 15.88	54.9 46.1
"	Snow Road	"	Westport	38.08	22.94	60.2
Moira	Foxboro'	"	Queensboro'	28.31	18.84	66.5
Muskoka, S	Black's Bridge..	"	Beatrice	40.41	23.11	57.2
" N	Port Sydney	"	"	40.41	22.57	55.9
Napanee	Napanee	"	Westport	38.08	23.59	61.9
Petawawa	Petawawa	"	Pembroke	36.26	18.35	50.6
Tay	Glen Tay	"	Stonecliffe			
York	Bancroft	"	Westport	38.08	21.36	56.1
aux Sables	Massey	Northern Ont..	Turbine..... Whitefish.....	34.96	20.54	58.8
Blanche	Englehart	"	Haileybury	36.26	24.79	68.4
Frederickhouse	Frederickhouse	"	Timmins	34.23	23.00	67.2
Kapuskasing	Kapuskasing	"	Kapuskasing	23.98	12.20	50.9
Mississagi	Iron Bridge	"	Turbine	34.96	20.81	59.5
South	Powassan	"	Whitefish			
Spanish	Webbwood	"	Rutherford	30.29	20.40	67.3
Sturgeon	Smoky Falls	"	Turbine	38.79	20.52	52.9
English	Ear Falls	Northwest'n Ont.	Sturgeon Falls	28.70	22.42	78.0
"	Manitou Falls	"	Lac Seul	23.18	7.51	32.4
"	Oak Falls	"	"	23.18	7.26	31.3
"	Pine Ridge	"	"	23.18	7.18	31.0
Beaver	Kimberley	Southwest'n Ont.	Eugenia	32.39	17.65	54.5
Credit	Cataract Jct.....	"	Alton	31.96	9.91	31.0
Rocky Saugeen	Markdale	"	Eugenia	32.39	17.44	53.8
Saugeen	Port Elgin	"	Mt. Forest	38.86	17.24	44.4
"	Walkerton	"	Walkerton	36.32	16.90	46.5
Sydenham	Owen Sound	"	Eugenia	29.74	16.37	55.0
Thames, Main	Kilworth	"	Owen Sound			
" North	Fanshawe	"	Woodstock			
" South	Ealing	"	London	35.49	12.94	36.5
Grand	Belwood	Grand R. B'n...	Stratford			
"	Brantford	"	Stratford	36.68	11.99	32.7
"	Conestogo	"	Woodstock	29.74	11.67	39.2
"	Galt	"	Woodstock			
"	Glen Morris	"	Alton, Elora	31.00	13.17	42.5
"	York	"	Alton, Elora	31.78	12.76	40.2
Speed	Hespeler	"	Kitchener, Par's			
			Elora	29.10	13.17	45.3
			Georgetown			

Miscellaneous Measurements

River	Location	Date	Discharge in Sec.-ft.
Bighead	Meaford	Nov. 15, 1918.....	79
"	"	Jan. 5, 1919.....	184 (a)
"	"	Feb. 3, 1919.....	148 (a)
"	"	Apr. 5, 1919.....	250
"	"	May 17, 1919.....	185
"	"	June 12, 1919.....	77
"	"	June 13, 1919.....	68
"	"	July 6, 1919.....	1.5
"	"	July 17, 1919.....	1.5
"	"	Aug. 28, 1919.....	1.9
"	"	Sep. 10, 1919.....	1.6
Black Creek.....	Traverston.....	July 3, 1919.....	18
"	"	" 12, 1919.....	11
"	"	" 13, 1919.....	11
"	"	" 17, 1919.....	11
"	"	" 18, 1919.....	10
Madawaska.....	Claybank	June 4, 1919.....	10,772
Mississippi	Ragged Chute.....	Sep. 8, 191.....	276
South.....	above Cox's Chute.....	Dec. 5, 1918.....	229
"	"	Jan. 25, 1919.....	150

(a) Ice measurement.

NORTH-WESTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in the North-Western Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1918				1919								
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year.
English River at Ear Falls.....	11,700	.50	.54	.66	.63	.55	.43	.44	.48	.38	.63	.60	.61	.55
English River at Manitou Falls.....	14,600	.48	.53	.63	.60	.54	.42	.43	.47	.56	.60	.58	.59	.54
English River near Oak Falls.....	15,570	.47	.52	.63	.60	.52	.42	.42	.46	.55	.60	.57	.59	.53
English River at Pine Ridge, H. B. Co's. Post.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turtle River at Mountain Rapids	1,160	.....	.56	.67	.66	.58	.50	.44	.51	.61	.66	.64	.65	.59
Wabigoon River near Quibell	2,400	.....	.54	.....	.....	.....	.....	1.07	1.35	.61	2.04	1.10	.69	1.06
		.....	.25	.....	.....	.....	.....	.....	.94	.83	1.58	1.12	.79	.92

NORTHERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in the Northern Ontario District for which such data are available in this report.

Station	Drainage Area Sq. miles	1918				1919				Year.				
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Aux Sables River at Massey	524	1.12	2.18	1.60	.93	.61	1.19	3.19	2.80	2.36	.69	.44	1.04	1.51
Blanche River near Englehart	430	2.69	1.76	.71	.53	.27	.24	5.21	6.60	1.05	.41	.33	2.06	1.83
Frederickhouse River at Frederickhouse	1,260	2.86	2.19	1.29	.72	.48	.40	1.83	5.16	2.15	.26	.41	2.52	1.69
Kapuskasing River at Kapuskasing	2,820	.92	1.32	.67	.36	.29	.25	1.54	2.84	1.07	.27	.27	.90	.90
Mississagi River at Iron Bridge	3,565	1.31	2.28	1.88	1.34	.66	.82	3.71	2.98	1.84	.69	.36	.48	1.53
South River near Powassan	2,294	1.77	1.89	1.51	.90	.57	2.22	3.74	3.00	1.26	.28	.43	.42	1.50
Spanish River near Webbwood	4,340	.95	2.01	1.63	.70	.54	1.05	3.82	3.87	.75	.59	.57	.63	1.51
Sturgeon River near Smoky Falls	2,570	1.35	1.67	1.01	.85	.90	1.05	3.00	4.10	2.74	1.09	.84	1.17	1.65

EASTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in Eastern Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1919										Sept.	Year.	
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July			
Black River near Washago	585	1.00	1.55	2.39	2.73	.82	3.56	4.01	2.48	1.39	.42	.16	.11	1.72
Bonnechere River at Renfrew.....	910	.47	1.05	1.07	1.21	.89	1.15	2.10	3.27	2.40	.34	.24	.25	1.20
Madawaska River at Madawaska Falls	800	1.05	1.09	1.17	1.09	.60	.79	1.89	2.62	1.94	.44	.26	.20	1.10
Magantanaway River (North Branch) near Burk's Falls	107	2.72	2.57	2.44	1.49	.87	2.75	6.00	4.59	1.98	.38	.37	.61	2.24
Magantanaway River (South Branch) near Burk's Falls	257	1.63	1.95	1.58	1.44	1.13	1.47	4.04	3.11	1.80	.66	.59	.50	1.66
Mississippi River at Appleton	1,150	.62	.93	1.16	1.25	.81	1.61	3.64	3.67	2.60	.60	.39	.39	1.47
Mississippi River at Ferguson's Falls	1,042	.94	.96	1.28	1.23	.66	1.59	3.96	4.17	2.62	.58	.42	.35	1.54
Mississippi River at Galetta	1,456	.63	.85	.93	.78	.47	1.39	3.05	3.08	1.85	.41	.27	.27	1.17
Mississippi River near Snow Road	446	.66	.74	1.24	1.21	.71	1.90	3.87	4.80	2.98	.84	.73	.58	1.69
Moira River near Foxboro	1,038	.53	1.30	1.72	1.23	.48	2.65	3.41	3.42	1.35	.29	.12	.08	1.39
Muskoka River (South Branch) at Black's Bridge	668	1.35	1.95	1.65	1.76	1.22	1.54	3.65	2.99	2.31	1.15	.46	.41	1.70
Muskoka River (North Branch) near Port Sydney	660	1.62	1.64	2.08	1.54	1.09	2.09	4.52	2.94	1.06	.33	.38	.66	1.66
Napanee River near Napanee	300	1.00	1.82	1.93	1.50	.55	3.40	3.78	4.28	1.91	.37	.12	.11	1.74
Petawawa River near Petawawa	1,572	.76	1.16	1.20	1.00	.77	.75	2.48	3.11	2.56	1.40	.61	.41	1.35
Tay River near Glen Tay	204	1.00	1.15	1.28	1.24	1.02	1.88	2.11	3.09	2.33	1.45	1.28	1.01	1.57
York River near Bancroft	374	1.34	1.76	2.37	1.65	.97	1.89	3.18	1.94	1.06	.49	.41	.41	1.51

SOUTH-WESTERN ONTARIO DISTRICT
GRAND RIVER BASIN

Summary of Discharge

Summary of discharge in second feet per square mile for regular river stations on Grand River and tributaries for which such data are available in this report

Station	Drainage Area Sq. miles	1918			1919			Year					
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
Grand River at Belwood.....	280	.48	.84	2.17	1.11	.33	3.41	2.50	2.05	.22	.04	.03	1.11
Grand River at Brantford.....	2,000	.43	.63	1.58	.49	.33	3.26	1.85	1.95	.41	.19	.18	.96
Grand River near Conestogo.....	550	.54	.58	1.55	1.35	.26	3.82	2.04	1.79	.26	.05	.05	1.04
Grand River at Galt.....	3,360	.36	.50	1.42	.52	.32	3.67	1.69	1.65	.27	.08	.09	.90
Grand River at Glen Morris.....	3,390	.36	.64	1.54	.45	.26	3.94	1.92	1.75	.32	.11	.11	.97
Grand River at York.....	2,580	.39	.57	1.27	1.02	.48	2.98	1.46	2.09	.38	.20	.18	.94
Speed River at Hespeler.....	250	.45	.55	1.10	.65	.45	3.16	1.68	2.03	.44	.33	.38	.97

SOUTH-WESTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in South-Western Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1918			1919									
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
Beaver River near Kimberley.....	100	.87	.96	1.14	1.15	.98	2.24	2.25	2.30	1.22	.72	.85	.90	1.30
Credit River at Cataract Junction.....	85	.34	.34	.53	1.34	.24	2.80	.91	.96	.48	.26	.24	.22	.73
Rocky Saugeen River near Markdale.....	96	.67	.90	1.26	1.23	1.09	2.65	2.43	1.99	1.11	.78	.67	.60	1.28
Saugeen River near Port Elgin.....	1,565	.49	1.10	1.82	2.18	.91	3.91	1.92	1.61	.47	.29	.23	.25	1.27
Saugeen River near Walkerton.....	850	.53	1.07	1.94	1.19	.74	3.74	2.22	1.84	.58	.39	.34	.30	1.24
Sydenham River near Owen Sound.....	71	.34	.90	1.90	1.39	1.03	4.04	2.08	1.55	.46	.28	.23	.21	1.21
Thames River (Main Stream) at Kilworth	1,270	.20	.43	1.53	1.00	.66	2.97	1.85	2.21	.33	.07	.05	.05	.95
Thames River (North Branch) near Fanshawe	585	.05	.11	1.84	1.04	.62	1.92	2.08	2.07	.19	.04	.04	.04	.88
Thames River (South Branch) near Ealing	515	.25	.34	1.14	1.04	.62	2.34	1.75	2.10	.31	.13	.12	.15	.86

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